Vol. 892 Number 3

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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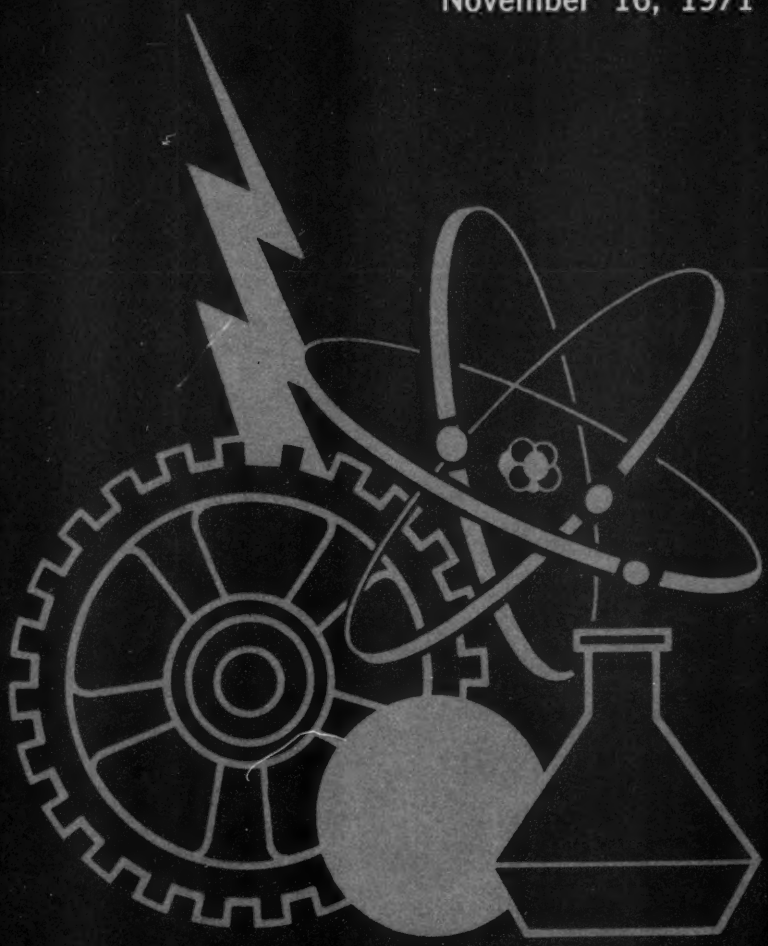
PATENTS

November 16, 1971



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

November 16, 1971 Volume 892 Number 3

CONTENTS

	Page
Issue of November 16, 1971	811
Patents and Trademark Notices	
United States Adopted Names	812
Patent Suits	812
Patent Notices	
Certificates of Correction for the Week of November 16, 1971	814
Erratum	814
Disclaimers	814
Dedications	814
Condition of Patent Applications	815
Patents Granted	
General and Mechanical	816
Chemical	1026
Electrical	1101
Design Patents Granted	1196
Index of Patentees	PI 1
Index of Designs	PI 49
Classification of	
Patents	PI 51
Designs	PI 53
Geographical Index of Residence of Inventors	
Patents	PI 54
Designs	PI 56

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PATENT OFFICE NOTICES

United States Adopted Names

List No. 28

November 1, 1970 to February 28, 1971

The following nonproprietary names for the drugs described have been adopted by the USAN Council (the nomenclature committee sponsored by the American Medical Association, the American Pharmaceutical Association, and the United States Pharmacopeial Convention) in cooperation with the interested manufacturers. The designation "United States Adopted Names" (USAN) has been coined to distinguish these formally adopted nonproprietary names from other nonproprietary names. Adoption of such names does not imply endorsement of the products involved by the A.M.A. Council on Drugs, the United States Pharmacopeia or the National Formulary.

Any comments or suggestions should be addressed to Doctor Joseph B. Jerome, Secretary, United States Adopted Names Council, American Medical Association, 535 N. Dearborn St., Chicago, Ill., 60610.

albuterol: bronchodilator
alclofenac: anti-inflammatory
berythromycin: antibiotic
capobenate sodium: treatment of acute myocardial infarction
carbenicillin indanyl sodium: antibiotic
dinoprost: action on smooth muscle
dinoprostone: action on smooth muscle
fenoprofen: anti-inflammmatory; analgesic
fluperamide: antiperistaltic antidiarrheal
glibornuride: oral hypoglycemic
glucosamine: pharmaceutic aid
guanabenz: antihypertensive
ketazolam: anti-anxiety
loperamide: antiperistaltic antidiarrheal
mebendazole: anthelmintic
padimate: sunscreen
pancuronium bromide: neuro-muscular blocking agent; peripheral muscle relaxant
penfluridol: neuroleptic
polymacon: contact lens material

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,129,332, D. Mastini, TELEPHONE SYSTEM, **filed** July 21, 1971, D.C. Md. (Baltimore), Doc. 71–784–N, *Domenico Mastini* v. *American Telephone & Telegraph Company and International Telephone & Telegraph Company.*

2,467,607, L. G. Bates, FILM FASTENING REEL, **filed** Apr. 27, 1966, D.C., S.D.N.Y., Doc. 66–C–1212, *Union Trust National Bank* v. *Audio Devices, Inc.* Stipulation and order, case dismissed with prejudice, June 22, 1971.

2,749,267, J. W. Gill, METHOD OF COVERING THE JOINT BETWEEN WALLBOARD AND THE RESULTANT PRODUCT, **filed** July 12, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1682, *United States Gypsum Co.* v. *Palmer Wallboard Tapes, Inc. et al.* **Same, filed** July 29, 1971, D.C., N.D. Calif. (San Francisco), Doc. C–71–1442, *Marco Paper Products Company* v. *United States Gypsum Company.*

2,761,178, Doorn and Pease, OPERATING MECHANISM FOR GIN BREASTS AND MULTIPLE GIN SYSTEM. **filed** June 18, 1971, D.C., M.D. Ala. (Montgomery), Doc. 3355–N, *Lummus Industries, Inc.* v. *Continental/Moss-Gordin, Inc.*

2,765,099, J. La Torre, BLIND BOLT UTILIZING DISTORTABLE COLLAR AND DEFORMABLE LOCKING NUT MEMBER, **filed** July 30, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1774–LLT, *Lockheed Aircraft Corporation* v. *The National Screw & Mfg. Co. and Monogram Industries, Inc.*

3,039,370, King and Margraf, PORTABLE CARTON BOTTOM SEALERS, **filed** June 10, 1966, D.C., S.D. Calif. (Los Angeles), Doc. 66–995–WB, *Bud Antle, Inc., etc.* v. *Stoddard Jess et al.* Default judgment, in favor of plaintiff and against defendant, June 21, 1971.

3,082,292, R. W. Gore, MULTICONDUCTOR WIRING STRIP, **filed** June 17, 1971, D.C. Del. (Wilmington), Doc. 4160, *W. L. Gore & Associates, Inc.* v. *Carlisle Corporation.*

3,089,301, S. J. Przekop, LAWN MOWER HANDLE SUPPORT, **filed** Dec. 8, 1969, D.C., E.D. Mich. (Detroit), Doc. 34030, *Fairway Construction Co.* v. *Brody-Bilt Construction Co., Morton Brody, doing business as Brody-Bilt Con. Co and Bonafide Garage Builders, Inc.* Consent permanent injunction, June 11, 1971.

3,104,799, D. J. Steidinger, ENVELOPE ASSEMBLY, **filed** June 15, 1971, D.C., E.D. Mich. (Detroit), Doc. 36658, *Perry Printing Co.* v. *Uarco, Inc.*

3,109,537, D. C. Larkin, REFUSE CONTAINER FOR MOTOR VEHICLE BODY, **filed** June 10, 1965, D.C., E.D. Mich. (Detroit), Doc. 26982, *Sterling Products Co., Inc.* v. *Crest Mfg. Co. and Daniel C. Larkin.* Judgment and order, plaintiff's Counts II and III are dismissed with prejudice, June 2, 1971.

3,121,006, Middleton and Reynolds, PHOTO-ACTIVE MEMBER FOR XEROGRAPHY, **filed** June 14, 1971, D.C., S.D.N.Y., Doc. 71–C–2630, *Xerox Corporation* v. *Savon Business Products, Inc.*

3,147,904, L. P. Larson, DISPENSING CARTON WITH RECLOSABLE POUR SPOUT, **filed** June 14, 1971, D.C., E.D. Mich. (Detroit), Doc. 36652, *Riegel Paper Corp.* v. *Ex-Cell-O Corp.*

3,164,129, P. D. Rigterink, AUTOMATIC NEST GUARD, **filed** June 21, 1971, D.C., S.D. Mich. (Detroit), Doc. 4–71–C–298, *Storm Systems, Inc.* v. *U.S. Industries, Inc.*

3,169,615, L. Stein, CARRYING CASE WITH FREELY HINGED CLOSURE, **filed** June 16, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1456, *Stebco Products Corporation* v. *Faircraft Engineering, Inc. and Sears, Roebuck & Co.*

3,174,869, Roberts and Faulkner, FLAKED COMESTIBLES AND PROCESS FOR PREPARING SAME, **filed** Apr. 23, 1969, D.C., E.D. Wash. (Spokane), Doc. 3255, *Vacu-Dry Company* v. *Tree Top Inc. et al.* Order of dismissal with prejudice, June 10, 1971.

3,175,288, Garwick and Clark, TRAY PACK PROCESSING CUTTER, **filed** June 18, 1971, D.C., N.D. Ill. (Freeport), Doc. 71c34, *Ray E. Clark and William N. Garwick* v. *Kutz-Kwik, Inc.*

3,181,205, Frommelt and Frommelt, PAD STRUCTURES, **filed** May 29, 1969, D.C., N.D. Ohio (Cleveland), Doc. 69–418, *Dubuque Awning & Tent Company* v. *Timbers & Associates, Inc., Nuckley Covers.* Consent judgment, June 9, 1971.

3,182,389, R. R. Rossi, WARNING LIGHT CONTROL SYSTEM, **filed** June 16, 1971, D.C.N.J. (Newark), Doc. C–896–71, *Arrow Safety Device Company* v. *Nassau Fastening Co. and Emanuel Mendelsohn and Carol Brown, doing business as School Bus Parts Co.*

3,219,207, A. R. Chasar, LOAD SENSING AUTOMATIC STORAGE APPARATUS, **filed** June 3, 1966, D.C., W.D.N.Y. (Buffalo), Doc. C–11,860, *The Triax Company* v. *Hartman Metal Fabricators, Inc.* Decision, Findings of Fact and Conclusions of Law dismissing plaintiff's complaint, June 16, 1971.

3,265,092, Ely, Burley and Clement, FEP-FLUOROCARBON TUBING; **Re. 27,028,** same, **filed** June 18, 1971, D.C. Del. (Wilmington), Doc. 4161, *Fluorodynamics, Inc.* v. *Penntube Plastics Company.*

3,297,155, Gattenby, D'Amato, Golner and Feinstein, TUBULAR CORES, **filed** Apr. 15, 1968, D.C. Del. (Wilmington), Doc. 3517, *Ethyl Corporation* v. *The Borden Company.* Stipulation of dismissal with prejudice as to Ethyl Corp. and without prejudice as to Borden, Inc., June 14, 1971.

3,327,852, Mortsell, deceased, by G. Ahlstrom, administrator, DRUM TYPE MAGNETIC SEPARATOR, **filed** June 24, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71–645, *Sala Maskinfabriks Aktiebolag* v. *The Hanna Mining Company, Inc.*

3,361,150, J. E. Horner, WATER CONDITIONING CONTROL SYSTEM, **filed** June 10, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1394–CC, *Universal Interloc, Inc.* v. *Hawkins Chemical Company et al.*

3,392,875, K. R. Bockenstette, STACKING TRAY WITH 90° NESTING, **filed** June 21, 1971, D.C., S.D. Ohio (Dayton), Doc. 4074, *Dare Plastics, Inc.* v. *Ekco Products, Inc.*

3,396,342, A. E. Feinberg, POWER SUPPLY CIRCUIT FOR CONTINUOUS WAVE MAGNETRON OPERATED BY PULSED DIRECT CURRENT, **filed** Apr. 30, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1026, *Advance Transformer Co.* v. *Sears, Roebuck & Co. and Litton Industries, Inc.*

3,409,175, Miller and Miller, PORTABLE WASHER AND COLLECTION TANK ASSEMBLY, **filed** Oct. 23, 1969, D.C., E.D. Wis. (Milwaukee), Doc. 69C491, *Hy-Way Heat Systems, Inc.* v. *Jadair Inc. and John H. Schmutzler.* Stipulated order dismissing plaintiff's complaint and defendants' counterclaim with prejudice, June 23, 1971.

3,409,916, Billig and Schleeweiss, OVAL SWIMMING POOL, **filed** June 3, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–677, *Bilnor Corporation* v. *Atreo Manufacturing Co., Inc.*

3,447,351, C. W. Werntz, ROLL FORMING MACHINE INCLUDING DIVIDED ROLL PARTS AND SPACERS THEREFOR, **filed** May 18, 1971, D.C., E.D. Mo. (St. Louis), Doc. 71C314(2), *The Lockformer Co.* v. *Engel Equipment, Inc.*

3,452,300, Cappucci and Seidel, FOUR PORT DIRECTIVE COUPLER HAVING ELECTRICAL SYMMETRY WITH RESPECT TO BOTH AXES; **3,452,301,** same, LUMPED PARAMETER DIRECTIONAL COUPLER, **filed** Nov. 12, 1970, D.C.N.J. (Newark), Doc. 1523–70, *Merrimac Research & Development, Inc.* v. *Western Electric Co. and Bell Telephone Labs., Inc.* Consent order of dismissal of complaint and amended complaint, June 14, 1971.

3,452,301. (See 3,452,300.)

3,485,018, Beckering, Duran and Lessig, LAWN MOWER DECK HOUSING, **filed** June 14, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1427, *Black & Decker Mfg. Co.* v. *Sunbeam Corporation.*

3,495,492, Gerber and Pearl, APPARATUS FOR WORKING ON SHEET MATERIAL, **filed** June 21, 1971, D.C., S.D. Ohio (Cincinnati), Doc. 8020, *Gerber Garment Technology, Inc.* v. *Cincinnati Milacron, Inc.*

Re. 26,740, P. V. Millard, METHOD OF MAKING SEALING MEMBERS, **filed** June 8, 1971, D.C., E.D. Mich. (Detroit), Doc. 36610, *Arco Industries Corp.* v. *Marlette Coatings, Inc.*

Re. 27,028. (See 3,265,092.)

Certificates of Correction for the Week of Nov. 16, 1971

3,373,390	3,565,912	3,578,369	3,584,667
3,499,033	3,566,273	3,579,069	3,584,837
3,531,497	3,566,944	3,579,286	3,584,877
3,531,973	3,567,453	3,579,884	3,584,959
3,536,317	3,568,182	3,580,228	3,585,117
3,538,085	3,568,637	3,580,442	3,585,199
3,539,192	3,568,873	3,580,494	3,585,273
3,543,137	3,569,604	3,580,872	3,585,368
3,549,365	3,569,849	3,581,063	3,585,430
3,553,244	3,570,553	3,581,714	3,585,476
3,553,493	3,570,685	3,582,618	3,585,635
3,553,612	3,571,694	3,582,672	3,585,702
3,554,125	3,573,282	3,582,863	3,586,108
3,554,978	3,573,305	3,583,154	3,586,286
3,555,774	3,574,341	3,583,463	3,586,311
3,556,001	3,574,960	3,583,500	3,586,657
3,557,144	3,575,234	3,583,797	3,587,095
3,558,991	3,575,345	3,583,860	3,587,209
3,559,564	3,576,444	3,584,059	3,588,969
3,560,057	3,576,633	3,584,244	3,589,285
3,560,263	3,576,818	3,584,255	3,589,892
3,560,341	3,576,840	3,584,257	3,590,389
3,561,983	3,576,866	3,584,414	3,591,644
3,561,984	3,578,145	3,584,575	3,596,024

Erratum

All references to Patent Number 3,578,244 to Lennart G. Erickson, Intermittent Sprinkler Irrigation System, appearing in the OFFICIAL GAZETTE of May 11, 1971, should be deleted as the application should not have been issued.

Disclaimers

3,306,864.—*Edward J. Lang*, Grand Island, *Frank S. Grazen*, North Tonawanda, and *Frank W. Less*, Kenmore, N.Y. PHENOL FORMALDEHYDE-UREA RESIN COMPONENT BINDER. Patent dated Feb. 28, 1967. Disclaimer filed Aug. 30, 1971, by the assignee, *Hooker Chemical Corporation*.

Hereby enters this disclaimer to claims 1 to 4, inclusive, of said patent.

3,422,068.—*Roland E. Kreibich, Harlan G. Freeman*, and *Gene F. Baxter*, Seattle, Wash., and *Karl F. Kumli*, Chico, Calif. METHOD OF PRODUCING AN ORTHO-DIRECTED PHENOLIC RESIN BY CONDENSING PHENOL AND HCHO IN THE PRESENCE OF A BIVALENT METAL ION AND THEN ADDING RESORCINOL, AND THE RESULTANT PRODUCT. Patent Dated Jan. 14, 1969. Disclaimer filed July 29, 1971, by the assignee, *Weyerhaeuser Company*.

Hereby enters this disclaimer to claims 1–7 of said patent.

3,581,754.—*Robert B. Adams*, Tredyffrin Township, Chester County, Pa. LIQUID LEVEL CONTROL APPARATUS USING FLUIDIC SENSOR. Patent dated June 1, 1971. Disclaimer filed Feb. 1, 1971, by the assignee, *Moore Products Co.*

Hereby disclaims the portion of the term of the patent subsequent to Aug. 23, 1983.

Dedications

3,579,442.—*Jack N. Gerwig*, South Charleston, W. Va. COAL CONVERTING PROCESS. Patent dated May 18, 1971. Dedication filed July 1, 1971, by the assignee, *Bird Machine Company*.

Hereby dedicates to the Public the entire term of said patent.

3,581,858.—*William J. Haley*, Muncie, Ind. FLUID ACTUATOR. Patent dated June 1, 1971. Dedication filed July 26, 1971, by the assignee, *Borg-Warner Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,593,443.—*Julius Christ Demetrius, Jr.*, Lansdale, and *Wayne Martin Grim*, Chalfont, Pa. LABEL FOR USE IN BLIND CLINICAL STUDIES OF A MEDICAMENT. Patent dated July 20, 1971. Dedication filed July 29, 1971, by the assignee, *Merck & Co., Inc.*

Hereby dedicates to the Public all the remaining portion of the term of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 2, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-18-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-24-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	9-08-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-19-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-25-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	3-01-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-13-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-14-70
PHYSICS, GROUP 280—R. L. EVANS, Director Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	8-31-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director Industrial Arts; Household, Personal and Fine Arts.	10-06-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	8-06-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	8-03-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-31-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	11-02-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	8-19-70

Expiration of patents: The patents within the range of numbers indicated below expire during November 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

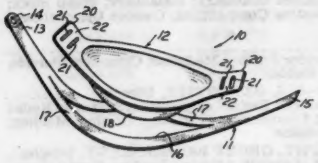
Patents..... Numbers 2,692,987 to 2,695,997, inclusive
Plant Patents..... Numbers 1,312 to 1,327, inclusive

PATENTS

GRANTED NOVEMBER 16, 1971

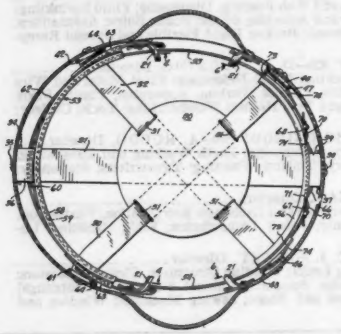
GENERAL AND MECHANICAL

3,619,813
HELMET CHIN STRAP
John L. Marchello, 56405 Grand River, New Hudson, Mich. 48165
Filed Nov. 19, 1969, Ser. No. 878,159
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **2 Claims**



A chin band having a central, elongated, slit receiving the bulged portion of a chin cup so that the band slit portions are arranged along the edges of the cup and converge together and tightly extend through band receiving slots formed on the opposite ends of the chin cup, with the cup being slidably movable within the band slit for adjusting its position along the band.

3,619,814
PROTECTIVE HELMET WITH ADJUSTABLE HEADBAND
Jackson Anthony Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Filed Dec. 11, 1969, Ser. No. 884,237
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 A **3 Claims**

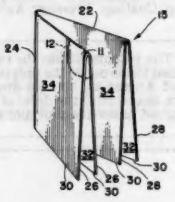


A rigid shell helmet having a pair of earcups mounted within the shell and an internal rigging including an adjustable headband for supporting the shell in spaced relation to a wearer's head. The headband structure comprises a front headband anchored at its ends to the shell and of fixed length shorter than the distance between its anchorage point as measured along the shell circumference; a rear headband loosely suspended within the shell; and a pair of side headbands respectively extending rearwardly from the front headband along opposite sides of the shell interior outwardly of the earcups. The side headbands are respectively secured to the rear headband by a pair of buckles which are carried by the rear headband on opposite sides of the helmet center line, and the extent of engagement of the side headbands with the buckles may be adjusted to vary the effective size of the headband structure.

3,619,815
EYELID SHIELD
Daniel D. Towner, Jr., 4953 Auburn Drive, San Diego, Calif. 92105
Filed Oct. 31, 1969, Ser. No. 872,977
Int. Cl. A61f *9/00*
U.S. Cl. 2—12 **4 Claims**

A highly flexible shield securable directly onto the eyelid and moving therewith. When the eyes are closed as in sunbathing the shield, being substantially opaque supplements the natural eyelids in protecting the eyes from harmful rays. Combined with an integral eyeshade the item has a second function and is also suitable for use by outdoor workmen and others exposed to bright sunlight or overhead lighting. The eyeshade is a unilateral forwardly extending translucent portion shading the eyes when open.

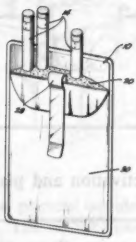
3,619,816
CONTOURED NECK TOWEL
Samuel H. Cowen, Southfield, Mich., assignor to Chemed Corporation, Cincinnati, Ohio
Filed Jan. 29, 1970, Ser. No. 6,782
Int. Cl. A41d *13/04*; B32b *27/10*
U.S. Cl. 2—49 **2 Claims**



A folded contoured neck towel is disclosed which is formed of a laminate of absorbent paper and liquid-im-

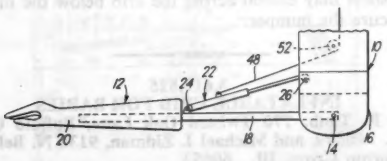
pervious plastic. The towel is particularly folded and constructed such that a corner portion may be readily removed prior to use as a protective bib.

3,619,817
INSERT RETAINER FOR RETAINING PENCILS, PENS, AND THE LIKE
Thomas D. Rockwell, 11147 Lull St., Sun Valley, Calif. 91352
Filed Oct. 10, 1969, Ser. No. 865,236
Int. Cl. A41d *27/00*
U.S. Cl. 2—250 3 Claims



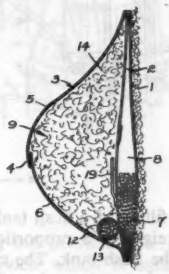
An insert for use in a pouch or case which is capable of retaining pens, pencils, and other utility equipment within the pouch or case is described. The insert is comprised of a foam rubber or sponge like material which is retained in a rigid position by a stiff backing material. A further stiffening means in the form of a spring-like member is positioned laterally across the backing material to prevent the sponge from collapsing. The sponge material is then placed in a pocket or case and clipped thereto by suitable clip means and pencils, pens and other articles are resiliently retained in the pocket pouch or case behind the insert.

3,619,818
ARTIFICIAL LIMBS
Dennis W. Collins, Kingston-upon-Thames, England, assignor to Hugh Steeper (Roehampton) Limited, London, England
Filed Oct. 1, 1969, Ser. No. 862,667
Claims priority, application Great Britain, Oct. 3, 1968, 47,045/68
Int. Cl. A61f *1/06*
U.S. Cl. 3—12 2 Claims



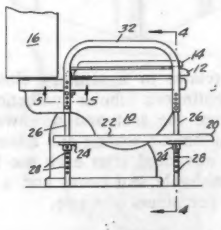
An articulated artificial limb having two pivotally-connected limb members representing, for example, the upper arm and the fore-arm respectively of a human arm, the two limb members being further linked together by a telescopic link having a readily-releasable locking device to permit the angle between the two limb members to be varied as required.

3,619,819
MAMMARY PROSTHESIS
Joyce Mann, Prospect, South Australia, Australia, assignor of a fractional part interest to Lance L. Mann, Prospect, South Australia, Australia
Filed June 3, 1969, Ser. No. 830,017
Claims priority, application Australia, June 3, 1968, 38,645/68
Int. Cl. A41c *3/10*
U.S. Cl. 3—36 1 Claim



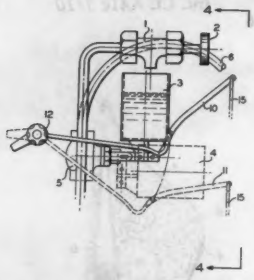
A mammary prosthesis in which loose granular material is held in a pocket to give minimum moving weight to the prosthesis but in which weights can be added to increase the total weight according to conditions of the patient existing at the time, a further feature being the use of sheepskin as the backing member with the wool in contact with the body and the use of a woven wool fabric for the forward part which is cut diagonally to the lines of the thread and sewn together to give the required shape but allowing stretch because of the diagonal positioning. A forward pocket is provided to take the added weights and also to contain wool top padding material by means of which the shape can be varied so that a prosthesis is provided in which both shape and weight can be altered at will.

3,619,820
TOILET SEAT AUXILIARY
Thomas R. Cain, 22320 Funston, Hawaiian Gardens, Calif. 90716, and Odas V. Medlock, 19907 S. Jersey Ave., Lakewood, Calif. 90715
Filed Apr. 24, 1970, Ser. No. 31,619
Int. Cl. A47k *17/02*
U.S. Cl. 4—9 7 Claims



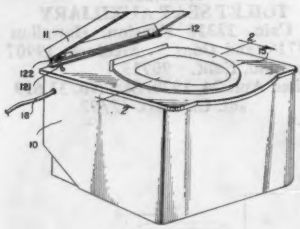
A toilet seat comprising a U-shaped member supported at a level below a toilet seat by collars vertically adjustable on supporting legs, said legs penetrating said U-shaped member and having telescopic engagement with downwardly extending portions of a pair of arm rests, said telescopic engagement being vertically adjustable. A portion of said arm rests and a portion of the cross part of said U-shaped member being finished with a highly frictional surface.

3,619,821
PLUMBING OF A TANK FILLER VALVE FOR A COMMODE
Evan H. Bobo, 501 N. Pearl St., McArthur, Ohio 45651
Filed Mar. 9, 1970, Ser. No. 877,178
Int. Cl. E03d *1/36*
U.S. Cl. 4—41 **2 Claims**



A control for the filling of a flush tank for a commode depending on the weight of a proportionate part of the water flowing into the flush tank. The control includes a three-way valve allowing water, when the valve is open, to flow into three separate conduits. One conduit leads to the flush tank, one to the commode, and the third to a relatively small auxiliary weight tank. The valve has its control stem connected to and operated by the relatively small auxiliary weight tank (which is sometimes herein designated as a water weight control box) into which a relatively small proportion of the water flowing through the valve flows. The amount of water flowing through the third conduit is controlled by a needle valve.

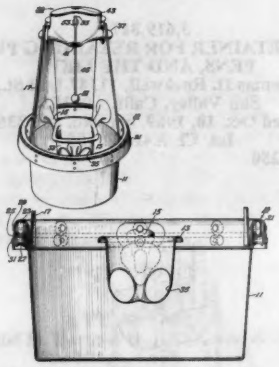
3,619,822
SANITARY CLOSET
Thomas Carmichael, 2311 Blanton Drive, San Antonio, Tex. 78209
Filed Nov. 18, 1969, Ser. No. 877,647
Int. Cl. A47k *11/02*
U.S. Cl. 4—142 **3 Claims**



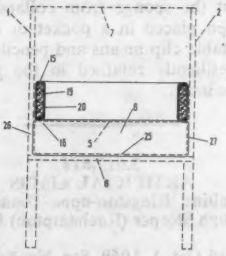
The disclosure relates to a sanitary closet equipped with a supply of continuous tubular synthetic plastic film which is drawn over the seat and downwardly into a toilet bowl to an automatic sealing and advancing mechanism. The film is advanced after each use to provide a sanitary and replenishable seat cover and a plurality of individually sealed containers of waste.

3,619,823
BABY SHOWER-BATH AND PLAY TUB
Alma R. Sackett, 4707 Gaston Ave., Dallas, Tex. 75246
Continuation-in-part of application Ser. No. 598,250, Dec. 1, 1966. This application Oct. 9, 1969, Ser. No. 865,152
Int. Cl. A47k *3/164, 3/22*
U.S. Cl. 4—148 **5 Claims**

A baby shower-bath and play tub having a seat mounted to swivel within the tub, the seat having a configuration to prevent a baby from toppling, and an overhead water dispenser and depending handle element to enable its selective activation and play by a bathing and showering baby.



3,619,824
CRIB BUMPER
Maura Jean Doyle, Woburn, Mass., assignor to Bunny Bear, Inc., Everett, Mass.
Filed Feb. 10, 1970, Ser. No. 10,238
Int. Cl. A47l *22/20*
U.S. Cl. 5—93 **6 Claims**

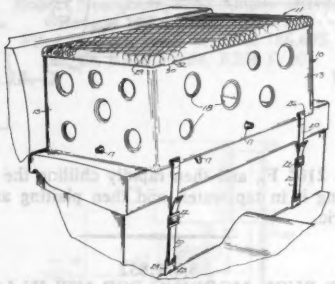


A crib bumper for use in infants' cribs having side rails and a mattress, with an upper surface of the mattress below the upper edges of the side rails of the crib. The bumper is provided with a sheet attached at its side edges to the lower edges of opposite sides of the bumper. The sheet may extend across the crib below the mattress to secure the bumper.

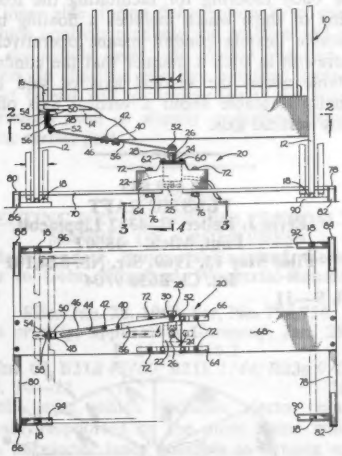
3,619,825
INFLATABLE CRIB FOR BABIES
Jack E. Taub, 770 Twisted Oak Lane, Buffalo Grove, Ill. 60090, and Michael J. Zidman, 9138 N. Bellefort, Morton Grove, Ill. 60053
Filed Sept. 12, 1969, Ser. No. 857,344
Int. Cl. A47c *9/00, 27/08*
U.S. Cl. 5—94 **1 Claim**

A plurality of inflatable side panels and an inflatable bottom panel are secured together to form an inflatable crib for babies. The side panels are provided with ventilating apertures that are randomly spaced to maintain maximum structural rigidity of the crib in its inflated condition. The crib is secured on the back seat of an automobile by straps, each of which has a hook secured to one end

and a holding bar secured to its other end. The hooks are suitably anchored to either the front or rear of the back seat structure and each holding bar is inserted endwise through a slot provided therefor in one of the side panels of the crib. Each slot is shorter than the holding bar, and after each holding bar passes completely through its slot, its strap is twisted to move it out of axial alignment with its slot to prevent accidental separation of the strap from the crib. The bottom panel of the crib may be integral with the side panels, or may be separate from the side panels and secured thereto by snap fasteners. The fastener elements on the bottom panel are spaced from its edges to permit the use of a fitted sheet on the bottom panel.

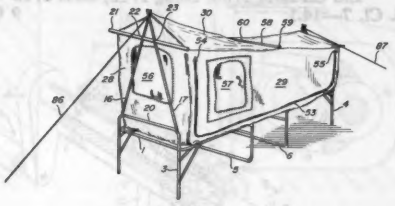


3,619,826
BABY CRIB ROCKER
Albert R. Lizotte, Sr., 14307 Tiara St., Van Nuys, Calif. 91401
Filed Apr. 2, 1970, Ser. No. 25,184
Int. Cl. A47d *9/02*
U.S. Cl. 5—109 **9 Claims**



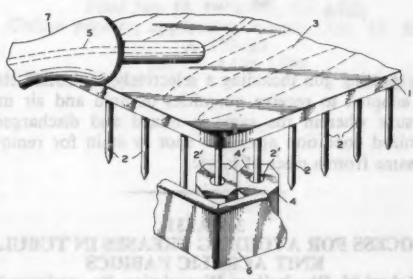
A motor actuated baby crib rocking apparatus wherein the castered legs of the baby crib are to optionally cooperate with either riding tracks permitting horizontal longitudinal crib movement or rocking tracks permitting transverse arcuate crib movement. The motor operates through a linkage assembly to transmit rotary motion into lineal motion, the linkage assembly including connections permitting two-dimensional movement incurred during the rocking movement.

3,619,827
LIGHTWEIGHT DETACHABLE TENT-COT MEANS
Albert H. Mackenzie, 1632 E. Claremont St., Phoenix, Ariz. 85016
Filed Oct. 2, 1970, Ser. No. 77,602
Int. Cl. A45f *1/00, 3/00*
U.S. Cl. 5—113 **12 Claims**



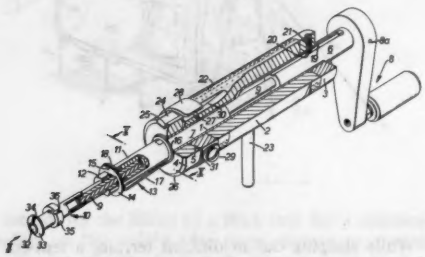
While sleeping out in difficult terrain, a tent-cot combination is provided which is sufficiently compact for ready transport upon the user's back while nonetheless providing complete protection when erected. A lightweight cot frame is provided at each end with studs or equivalent means for supporting tubular end frame structure in an upright position. A fully enclosed tent is supported off the ground by the cot frame and is held upright between the end frame structures at the head and foot ends of the assembly. Three basic embodiments disclosed use diverse end frame structures; viz: a modified A-frame, a trapezoid frame, and a straight pentagonal frame. All the embodiments disclosed fold into a compact unit for carrying by articulating the head and foot ends of the cot frame inwardly to form a "sandwich" unit with the tent proper disposed within the cot frame. An attachment to one of the cot frame leg means permits it to be disposed horizontally outwardly to function as a carrying platform for additional supplies.

3,619,828
HONEY-EXTRACTING METHOD AND APPARATUS
Lydia Phippen Ogilby, 306 Washington St., Belmont, Mass. 02178
Filed July 7, 1969, Ser. No. 839,409
Int. Cl. A01k *59/02*
U.S. Cl. 6—12 **3 Claims**



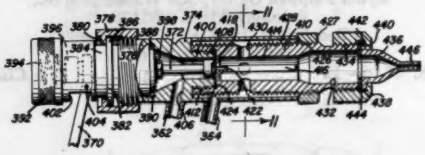
This disclosure involves the extraction of honey from wax-capped honey-filled honeycombs and the like with the aid of electrically heated probes and flat surfaces that automatically and rapidly remove the cap to expose the honey within the honeycomb cells.

3,619,829
WIRE WRAPPING TOOLS
Frederick George Finn, Sevenoaks, and Charles John Gaut, Morden, England, assignors to The Post Office, London, England
Filed Sept. 16, 1969, Ser. No. 858,276
Claims priority, application Great Britain, Sept. 17, 1968, 44,076/68
Int. Cl. B25f *1/00*; H02g *1/12*; B21f *3/00*
U.S. Cl. 7—14.1 9 Claims



A wire wrapping tool comprising a wrapping head mounted upon a driving shaft and an insulation stripper device mounted upon tubular means through which the driving shaft passes. The insulation stripper is slidable axially upon the driving shaft thereby enabling a wire to be stripped of insulation before the wire is wrapped.

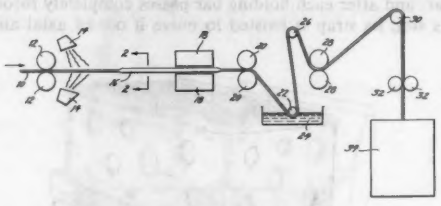
3,619,830
COMBINED SPOTTING BOARD AND SPOTTING GUN INCORPORATING NOVEL SPOTTING METHOD
William M. Harris and Julian Reese, Spartanburg, S.C., assignors to Spotting Equipment Co., Inc., Spartanburg, S.C.
Continuation of application Ser. No. 781,649, Sept. 9, 1968, which is a continuation of application Ser. No. 274,104, Apr. 19, 1963. This application Mar. 25, 1970, Ser. No. 20,474
Int. Cl. B05b *7/04*
U.S. Cl. 8—149.1 7 Claims



A spotting gun including a selectively controlled chamber adapted to receive quantities of fluid and air under pressure wherein the same is mixed and discharged in atomized condition against a spot or stain for removing the same from a piece of fabric.

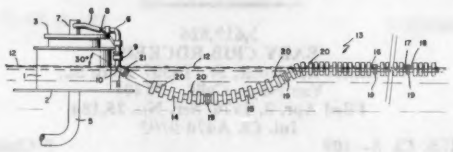
3,619,831
PROCESS FOR AVOIDING CREASES IN TUBULAR KNIT ACRYLIC FABRICS
Robert M. Oberholtzer, Wyomissing, Pa., assignor to O. B. Dyers, Inc., Reading, Pa.
Filed May 29, 1969, Ser. No. 828,893
Int. Cl. B08b *3/00*
U.S. Cl. 8—149.1 5 Claims

A process for avoiding creases in tubular knit acrylic fabric intended for use in the manufacture of clothing comprising heating a moving wet knitted tube of said fabric so that the temperature of the fabric's surface water is raised to between 130° to 160° F., exposing said moving fabric to the action of live steam whereby the temperature of the surface water is raised to between



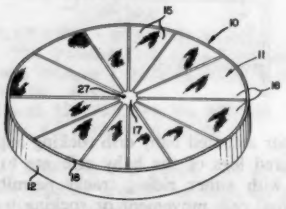
180° to 210° F., and then rapidly chilling the fabric by quenching it in tap water, and then plaiting and drying the fabric.

3,619,832
SINGLE BUOY MOORING FOR USE IN LOADING AND UNLOADING SHIP
Simon Westra, The Hague, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Filed July 25, 1969, Ser. No. 844,998
Claims priority, application Great Britain, Aug. 2, 1968, 37,053/68
Int. Cl. B63b *21/50*
U.S. Cl. 9—8 P 1 Claim



Single buoy mooring for facilitating the loading and unloading of ships which includes a floating buoy having floatable flexible conduit means operatively associated therewith in such a manner that the conduit means is rotatable about the vertical axis of said buoy and additionally rotatable about a vertical axis offset from said buoy vertical axis.

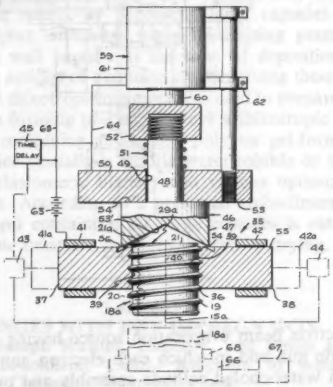
3,619,833
PLASTIC RAFT
Ervin J. Keller, G–4382 Lippincott, Flint, Mich. 48507
Filed May 13, 1969, Ser. No. 824,101
Int. Cl. B63c *9/04*
U.S. Cl. 9—11 8 Claims



A lightweight plastic raft including a top support surface with a dependent rigid foam plastic ring side providing flotation and defining a central air chamber. Slightly spaced, segment shaped, rigid cores are provided for the

top joined by the fibre glass resin composition with which the top is coated. A valve communicates the air chamber with atmosphere and permits the raft to be vacuum locked to the water.

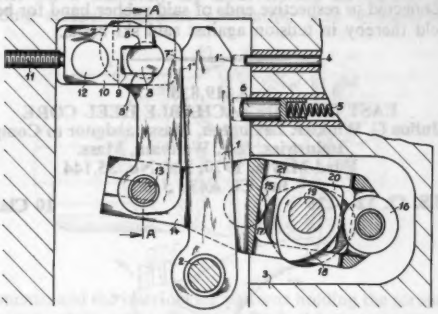
3,619,834
MANUFACTURE OF FASTENER UTILIZING DEFORMED THREAD AS STOP SHOULDER
Robert Neuschotz, 1162 Angelo Drive, Beverly Hills, Calif. 90210
Filed Dec. 23, 1968, Ser. No. 786,075
Int. Cl. B21d *53/24*; B23g *9/00*
U.S. Cl. 10—2 **18 Claims**



Methods and apparatus for manufacturing a fastener having an external thread with an axially outer end turn deformed to a condition in which the deformed thread portion will serve as a stop shoulder for limiting the extent to which the fastener can be screwed into a carrier part, and with the end turn being contacted directly at its axially inner side during deformation by a shaping surface, which controls precisely the position and configuration of the axially inner side of that end turn after deformation, so that the effective stopping surface of the deformed thread will accurately locate the fastener in a predetermined flush or slightly underflush position relative to the carrier part.

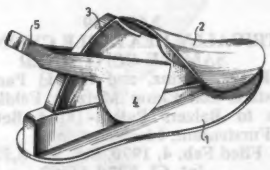
3,619,835
EJECTING DEVICE FOR BOLTS FROM THE MATRIX OF A BOLT PRESS
Heinrich Nebendorf, Wuppertal-Ronsdorf, Germany, assignor to Gebr. Hilgeland, Wuppertal-Ronsdorf, Germany
Filed Jan. 28, 1969, Ser. No. 794,716
Claims priority, application Germany, Jan. 29, 1968, P 16 52 860.2
Int. Cl. B21d *45/00*; B21k *1/44*; B23g *9/00*
U.S. Cl. 10—11 **10 Claims**

A bolt press which includes ejector pin means reciprocably supported by the press frame which latter supports an ejector lever operable to actuate an ejector pin for ejecting a bolt while an intermediate lever is operable to actuate the ejector lever. First pivot means pivotally supports the intermediate lever at one end portion thereof while slide means supporting said first pivot means is slidably supported by the frame means so as to be movable in axial direction of and toward and away from said ejector pin means. The said slide means supports abutment means for abutting engagement with a cam surface area on said intermediate lever and adjusting means are provided for adjusting the slide means, actuating means supported by said frame means including movable arm means carrying second pivot means pivotally



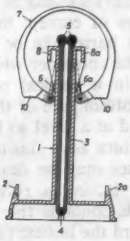
connecting the other end portion of the intermediate lever to said arm means.

3,619,836
SHOETREE
Woldemar Heinrich Tank, Bandhagen, Sweden, assignor of a fractional part interest to Toomas Tank, Bandhagen, Sweden
Filed Apr. 1, 1970, Ser. No. 24,783
Claims priority, application Sweden, Apr. 1, 1969, 4,644/69
Int. Cl. A43d *5/00*
U.S. Cl. 12—117.2 **7 Claims**



The present invention relates to a shoetree device comprising upper and lower members that are disengageably interconnected by a supporting arm. An adjustment means is provided to permit adjustment of the angle between the supporting arm and the lower member.

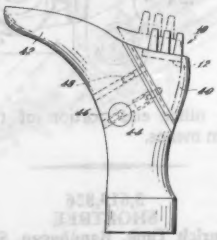
3,619,837
SHOETREE
Thomas G. Smolka, Vienna-Mauer, Austria, assignor to Wiener Metallwarenfabrik Smolka & Co., Vienna-Mauer, Austria
Filed Jan. 13, 1970, Ser. No. 2,474
Claims priority, application Austria, Jan. 13, 1969, A 273/69
Int. Cl. A43d *5/00*
U.S. Cl. 12—120.5 **11 Claims**



A shoetree primarily for ski boots. Same includes a central post with means on each side thereof rigid with respect to the post for receiving one end of each of a pair of ski boots. An elongated elastic device such as

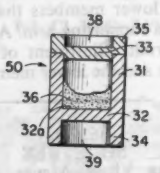
a rubber band is hung at its midpoint on or near said post. Independent clamp structures are arranged to engage the other ends of each of said ski boots and are connected to respective ends of said rubber band for being held thereby in tension against said ski boots.

3,619,838
LAST WITH DETACHABLE HEEL CORE
Julius G. Winkler, Lexington, Mass., assignor to Compo Industries, Inc., Waltham, Mass.
Filed May 6, 1970, Ser. No. 35,144
Int. Cl. A43d *3/00*
U.S. Cl. 12—135 **10 Claims**



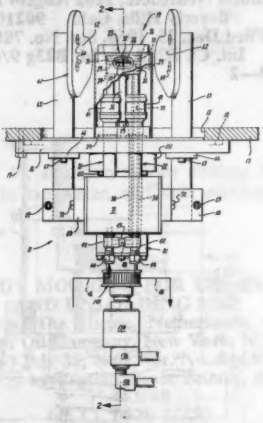
A last provided with a detachable heel core for shoe molding operations, the heel core being connected to the last during the molding operation and automatically detachable therefrom when the finished shoe is stripped from the last to allow the last to be removed and thereafter to be extracted from the stripped shoe.

3,619,839
ELECTRICALLY HEATABLE CYLINDRICAL SAMPLE CONTAINER
Thaddäus Kraus, Vaduz, and Gerold Paesold, Balzers, Liechtenstein, and Elmar Metzler, Feldkirch, Austria, assignors to Balzers Patent- Und Beteiligungs-AG, Balzers, Furstentum, Liechtenstein
Filed Feb. 4, 1970, Ser. No. 8,521
Int. Cl. F27d *11/02*
U.S. Cl. 13—20 **6 Claims**



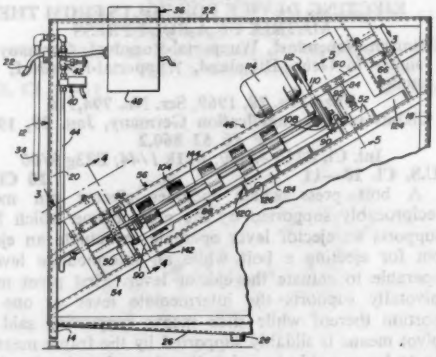
An electrically heatable cylindrical sample container made of a graphite or carbon material is designed as a closed capsule. The device is used for testing samples, particularly for the analytical determination of the gas content of the sample and it is adapted to be clamped by its upper and lower ends between two current supply electrodes in a vacuum furnace and be heated in the furnace by the direct passage of current therethrough. The container is made of a barrel-like or cylindrical configuration and a zone of the container which attains the highest temperature when in a vertical position of use is designed so that the bottom face of the interior of the container will be located at a level so that it is embraced by the highest temperature zone during operation. For this purpose the container may be designed as a tubular or barrel-like member having a recessed bottom wall so that this wall which contains the material being tested will be located toward the hottest furnace zone. A further possibility for shifting the hottest furnace zone toward the lower end of the container in order to intensify the generation of heat at this lower end is to provide a tapering of the lower end of the container.

3,619,840
ELECTRON BEAM EVAPORATION SOURCE
Vernon C. Spellman, Santa Rosa, Calif., Nils H. Bergfelt, Stockholm, Sweden, and Edward A. Small, Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.
Filed July 10, 1969, Ser. No. 840,777
Int. Cl. H05b *7/00*
U.S. Cl. 13—31 **22 Claims**



Electron beam evaporation source having at least one electron gun and in which each electron gun is provided with a water-cooled cathode assembly and means is provided for rotating the body of material which is to be evaporated to achieve a more uniform rate of evaporation. To permit operation for long periods of time, means is provided for continuously supplying material to be evaporated. In addition, in order to achieve greater evaporation rates, a plurality of electron guns are utilized for evaporating material from the same body of material.

3,619,841
GOLF CLUB WASHER
George F. Russell, 25 Palmer Ave., Kenmore, N.Y. 14217, and Richard McWain, 21 Union St., Batavia, N.Y. 14020
Filed Oct. 9, 1969, Ser. No. 865,067
Int. Cl. A46b *13/04*
U.S. Cl. 15—21 D **8 Claims**



A set of golf clubs are cleaned by insertion into guide troughs extending downwardly at an angle from the front panel of a washing machine having a pivotally supported brush assembly. Upon displacement of the brush assembly

into contact with the heads of the inserted golf clubs, water jets are discharged into the brush elements while being rotated by a motor. The club heads are properly positioned in the guide troughs by stops.

3,619,842

METHOD, ARTICLES AND COMPOSITIONS OF MATTER CONTAINING LARGE CAPSULES

Theodore Maierson, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,440
Int. Cl. A47l *23/05*; B01j *13/02*; B08b *1/00*
U.S. Cl. 15—104.93 19 Claims

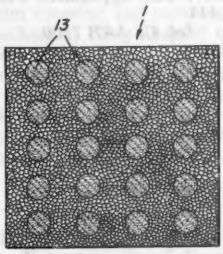
This disclosure is directed to a method for forming articles containing large (500 to 5000 microns) capsules in a flexible matrix by depositing large capsules upon various support substrates while minimizing premature capsule cell wall rupture at the time of deposition and prior to use; articles of manufacture containing these large capsules and thixotropic compositions used to prepare such articles. The forming process employs a thixotropic aqueous matrix containing an organic polymer gel-former, a flexible binder (usually a readily water-soluble or water-dispersible elastomeric binder) and various optional adjuvant fillers. According to a preferred embodiment, the thixotropic gel containing the large capsules is extruded onto a flexible substrate support followed by drying.

3,619,843

SPONGES WITH DRY IMPREGNANTS

Ferdinand Joseph Richter, Danbury, and Philip Joseph Messer, Brookfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 26, 1969, Ser. No. 827,804
Int. Cl. A47l *13/17*
U.S. Cl. 15—104.93 4 Claims



Impregnated sponges prepared by a process which comprises depositing particulate material on one surface of the sponge, piercing the sponge with at least one spike per square inch of sponge surface to form crevices between the sponge and outer surface of each spike, the spikes extending into the particulate material, drawing particulate material into each crevice, and removing the sponge from the spikes after the crevices are substantially filled with particulate material.

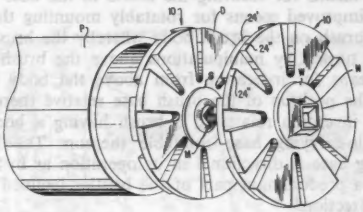
3,619,844

DISC TYPE PIPELINE SCRAPER AND BATCH SEPARATOR

Wilbur W. Collins and Jack L. Yost, Arlington, Tex., assignors to Oil States Rubber Co.

Filed Aug. 3, 1970, Ser. No. 60,549
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 R 5 Claims

A pipeline scraper and batch separator employing multiple similar molded plastic scraper discs having interlocking patterns on their faces for holding the discs in predetermined mutual circumferential orientation when the patterns are mated and the discs are clamped together on a mandrel, the discs having outwardly extending scraper segments alternating with notched-out segments, and the interlocking patterns holding the scraper segments of one disc over the notched-out segments of an adjacent disc so as to form a composite substantially-sealing structure useful either as scraper or as a batch separator.

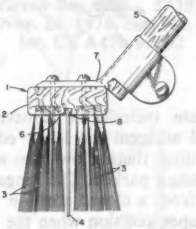


3,619,845

SQUEEGEE BRUSH

Melvin H. Partridge, Hadley, Mass., and George R. Hargis III, Cookeville, Tenn., assignors to Vistron Corporation, Cleveland, Ohio

Filed Nov. 17, 1969, Ser. No. 877,106
Int. Cl. A46b *15/00*
U.S. Cl. 15—117 3 Claims



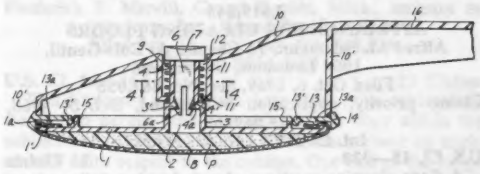
A squeegee push broom or brush is described which has a bristle-squeegee combination in which the bottom of the squeegee extends beyond the ends of the bottom of the bristles.

3,619,846

BRUSH WITH ROTATABLE BASE

Kurt Krusche, Frankfurt am Main, and Hubert Zimmermann, Mannheim, Germany, assignors to Allstar Verbrauchsguter G.m.b.H. & Co. KG, Frankfurt am Main, Germany

Filed Apr. 24, 1970, Ser. No. 31,670
Claims priority, application Germany, May 10, 1969, G 69 19 050.7
Int. Cl. A46b *9/10*
U.S. Cl. 15—172 11 Claims

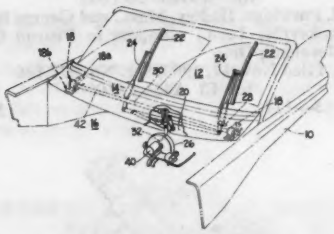


Improved brush with a main body and a selectively rotatable bristle-bearing base on the body. The brush is of the type having at least a predominant part of its

bristles inclined in the same direction and is adapted for cleaning purposes. The brush of the invention employs a fabric to carry the bristles, the fabric preferably being backed by a resilient pad. The invention provides improved means for securing the fabric to the base of the brush, improved means for rotatably mounting the base of the brush on the brush body whereby the brush base can be turned by manipulations above the brush body, and means for indicating from above the body of the brush the position of the brush base relative thereto.

This invention relates to a brush having a body and a bristle-carrying base rotatable thereon. The bristle-carrying base is directional in its operation as by having all, or a predominant part of the bristles inclined in the same direction.

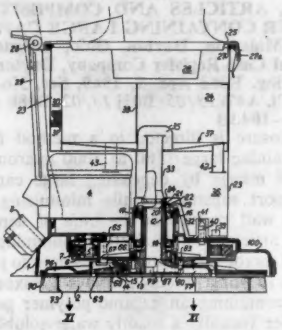
3,619,847
CONCEALED WINDSHIELD WIPER SYSTEM
Dionysios D. Papadatos, Kenmore, Raymond A. Deibel, West Falls, and William C. Riester, Williamsville, N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.
Filed Feb. 19, 1970, Ser. No. 12,627
Int. Cl. A47l *1/00*; B60s *1/02*
U.S. Cl. 15—250.16 **12 Claims**



A motor vehicle includes a transversely extending hinged cowl panel adjacent the lower edge of the windshield for concealing therebelow the windshield wiper arms and blades when parked. The hinged cover or cowl panel is movable from a closed position when the wipers are parked to an open position when the wipers are operating. A fluid pressure windshield wiper motor oscillates the wiper arms and blades through a linkage transmission. The motor includes an auxiliary linearly reciprocating drive shaft for moving the cowl to open position when the wiper motor is started before the arms and blades move out of parked position and to closed position when the wiper motor is switched off following movement of the wiper arms and blades to a depressed park position. The linearly reciprocating drive shaft is coupled to the hinged cowl panel through a releasable coupling assembly which can be uncoupled to permit manual movement of the cowl panel to an extreme open detent position for access to the equipment stowed therebelow. The coupling assembly is provided with an intermediate detent position for returning the cowl to a position to permit wiper operation in case of failure of the cowl retracting mechanism.

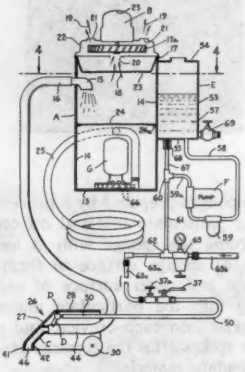
3,619,848
APPLIANCE FOR CLEANING FLOORS
Alfred M. Salzmann, 70 Chemin du Bois-Gentil, 1004 Lausanne, Switzerland
Filed Oct. 6, 1969, Ser. No. 864,055
Claims priority, application Switzerland, Oct. 9, 1968, 15,069/68
Int. Cl. A47l *11/162, 11/283*
U.S. Cl. 15—320 **16 Claims**

A floor cleaning appliance has a brush rotating about a hollow vertical spindle and a feed tank located in a recovery tank above the brush. Cleaning fluid fed from the feed tank to a central portion of the brush is dispersed radially outwardly through the brush by centrifugal force but its outward movement is checked by a vertical annular wall spaced inwardly from the periphery of the brush. In a peripheral portion of the brush outside the wall there are liquid-recovery cavities which are connected by pas-



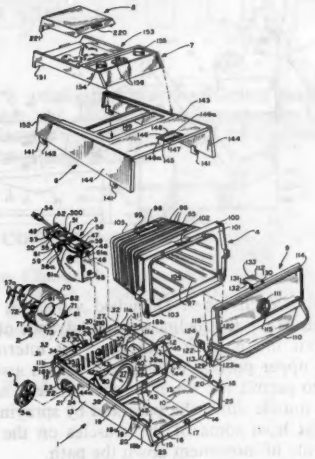
sageways with the hollow vertical spindle which leads to the recovery tank. Liquid collected in the cavities is conducted to the recovery tank by the evolute shape of the connecting passageways and a suction turbine in the recovery tank.

3,619,849
WET PICK-UP PORTABLE CLEANING APPARATUS
Judson O. Jones, 17 Inglewood Drive, Greenville, S.C. 29609
Continuation-in-part of application Ser. No. 818,876, Apr. 24, 1967. This application Feb. 24, 1970, Ser. No. 13,444
Int. Cl. A47l *7/00*
U.S. Cl. 15—321 **1 Claim**



A low profile portable wet pick-up cleaning head includes a sprayer positioned ahead of a suction nozzle for spraying a cleaning medium on a carpet and the like, closely adjacent a relatively wide nozzle as the head is moved across the carpet for drawing the used cleaning solution and foreign matter from the carpet using a centrifugal blower, creating circulation of a large volume of air through the wide nozzle leaving the piles of pile carpet in standing position, a special handle mounting facilitating manipulation of the head.

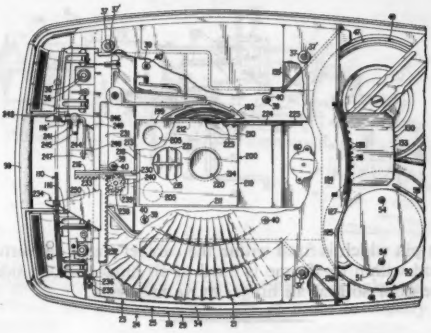
3,619,850
VACUUM CLEANER
Gerald E. Rideout, Danvers, and Clifford R. Walker, Peabody, Mass., assignors to Proctor-Silex Incorporated, Philadelphia, Pa.
Filed May 22, 1969, Ser. No. 827,010
Int. Cl. A47l 5/00
U.S. Cl. 15—323 16 Claims



A vacuum cleaner has a plurality of components adapted to be assembled and disassembled manually without the use of tools. The components include an upper and a lower shell, a vacuum chamber housing, a motor with housing, a cord rewind mechanism, a tool caddy, and a door; the vacuum chamber and motor housings and the cord rewind mechanism being adapted to releasably interrelate with the lower shell; and the tool caddy and door being adapted to releasably interrelate with both the upper and lower shells. The arrangement of components is such that the interrelation of the tool caddy component with the other assembled components is requisite to an operable electrical circuit.

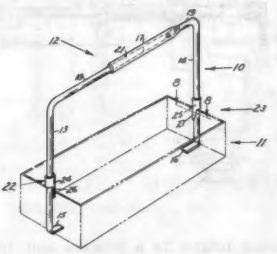
3,619,851
CONVERTIBLE CANISTER VACUUM CLEANER
James J. Bolzan, Jr., and Charles T. Fromknecht, Anderson, S.C., assignors to The Singer Company, New York, N.Y.
Original application Jan. 8, 1970, Ser. No. 1,498. Divided and this application Aug. 5, 1970, Ser. No. 61,206
Int. Cl. A47l 5/14
U.S. Cl. 15—330 16 Claims

A vacuum cleaner of the canister variety for domestic use having lower and upper housings secured together by U-shaped clips, and an intermediate housing. Between the upper and intermediate housings is disposed a hose storage compartment within which the hose is coiled when the cleaner is not in use. A dust bag is located within a vacuum chamber between the intermediate and lower housing. For converting the cleaner from suction to blower operation and vice versa there is provided a selectively operable lever controlled slide valve disposed between the hose and the vacuum chamber. In the suction mode the valve is positioned to communicate the hose with the filter bag and an exhaust door is positioned to communicate the blower exhaust with the room. A blower control lever extending out the front of the cleaner may be manually engaged to slide the valve to its blower position to thereby close the communication between the hose and the bag, close the exhaust door and communicate the hose to the blower exhaust. To revert to suction operation a blower control release lever is engaged to return



the valve to its suction position. A front panel, mounted on the intermediate housing and secured to the lower housing, operably mounts the suction/blower levers.

3,619,852
REMOVABLE BOX BAIL
Eric A. Eckberg, 509 S. Irwin St., Green Bay, Wis. 54301
Filed Nov. 10, 1970, Ser. No. 88,387
Int. Cl. A47b 95/02
U.S. Cl. 16—114 14 Claims

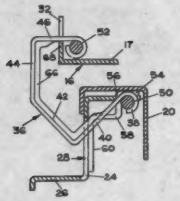


An attachable-removable bail or handle attachment, for a container, such as a vessel, basket, tray, box, carton, or the like, said bail having slidable clamp members operative to cam or wedge an intervening rim portion of such container directly against said bail to secure said bail immediately to said carton.

3,619,853
DOUBLE ACTING DOOR HINGE
Frederick F. Merrill, Grand Rapids, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.
Filed Jan. 13, 1969, Ser. No. 790,536
Int. Cl. E05d 3/06
U.S. Cl. 16—164 13 Claims

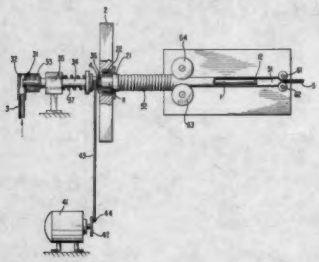
This disclosure relates to a door hinge for a cabinet and the like to permit flush mounting of the door within the cabinet and to permit rotation of the door about an angle of 180° with respect to the cabinet. One end of the hinge is concealed within the door and supports the door through a hinge pin which is fixed to the door. At the hinge pin, the hinge extends at an acute angle away from the door and away frrom a slot in the door through which

slot the hinge projects to permit rotation of the door relative to the hinge pin through an angle greater than 90°. The hinge is supported at the other end through a second



hinge pin which is fixed within the cabinet frame. A vertical rod within the frame is fixed to all hinges at one side of the door so that all hinges move in unison.

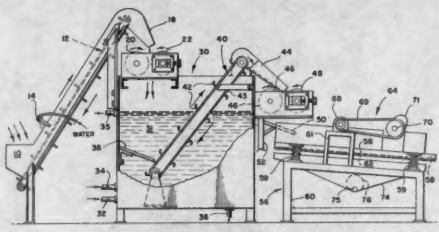
3,619,854
PROCESS FOR SHIRRING ARTIFICIAL SAUSAGE CASINGS
Erich Ilgen, Niedernhausen, and Horst Michl, Wallau, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Sept. 29, 1967, Ser. No. 671,866
Claims priority, application Germany, Oct. 1, 1966, K 60,371
Int. Cl. A22c *3/00*
U.S. Cl. 17—42 **4 Claims**



This invention relates to a process and apparatus for shirring a sausage casing, which process comprises slipping the casing over a mandrel rotating to and fro while maintaining an internal gas pressure in the casing, and compressing the casing against a stop with the formation of pleats.

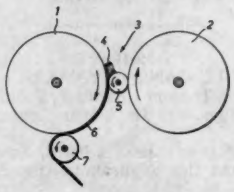
3,619,855
SCALLOP PROCESSING
Elmer Dryden Willis, Williston, N.C., assignor to Willis Bros., Inc., Williston, N.C.
Original application May 27, 1968, Ser. No. 732,247, now Patent No. 3,562,855, dated Feb. 16, 1971. Divided and this application Mar. 11, 1970, Ser. No. 23,530
Int. Cl. A22c *29/00*
U.S. Cl. 17—74 **5 Claims**

A method and apparatus are provided for extracting the adductor muscle from scallops. Scallops are subjected to a heat shock and are then mechanically agitated to disengage the muscle and attached viscera from the shell. The muscle and viscera are removed from the shells and separated from unfragmented portions of the shells on a vibrating screen and are then contacted with water before being separated from small shell fragments by flotation in a brine solution. Viscera is removed from the muscles by pulling on the viscera while restraining movement of the muscles. The invention also includes a method and apparatus for removing viscera from the adductor muscle of shucked scallops. Scallop muscles and attached viscera are placed on the upper surface of an inclined path formed by a plurality of rollers. Viscera is pulled from the scallop muscle and through the nip formed by adjacent rollers by rotating the upper portion of adjacent



rollers towards each other. Detached viscera is cleaned from the rolls below the inclined path. Advance of scallop muscles down the path is controlled by intermittently rotating the upper portion of adjacent rollers away from each other to permit the lower of the adjacent rollers to advance the muscle down the path and by spraying a flow of fluid on at least some of the muscles on the path to affect their rate of movement down the path.

3,619,856
DEVICE FOR MANUFACTURING PLASTIC FOILS, STRIPS AND THE LIKE
Michael Wienand, Siegburg, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed May 3, 1968, Ser. No. 726,494
Claims priority, application Germany, July 19, 1967, D 53,631
Int. Cl. B29h *9/00*
U.S. Cl. 18—2 C **2 Claims**

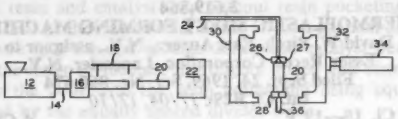


The device includes glazing rollers or roller assemblies used to produce plastic foils, strips or the like from viscous plastic masses. The mass is inserted between the rollers or in the roller assemblies so that the plastic material passes between the rollers and is produced in the requisite form of a foil, strip or the like.

3,619,857
SEALING OPEN END PARISONS
Dixie E. Gilbert, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Aug. 18, 1969, Ser. No. 850,957
Int. Cl. B29d *23/03*
U.S. Cl. 18—5 BQ **7 Claims**

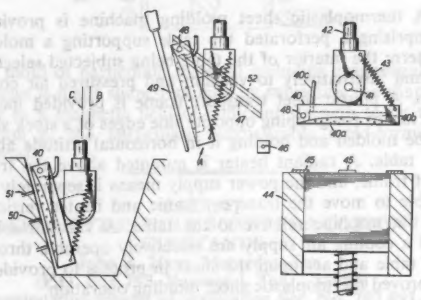
Open end parisons are held at one end and sealed by means of a device which cooperates with mold parts to thereafter sever the parison. The sealing and severing

device can be used to place the parison in the molding zone initially, or the parison can be placed in the molding zone by a separate means with the sealing and severing means reaching in to grasp an open end of the parison



and pull it axially to effect longitudinal orientation. In either event, the sealing and severing means maintains sealing pressure against the parison for a sufficient length of time for a seal to form.

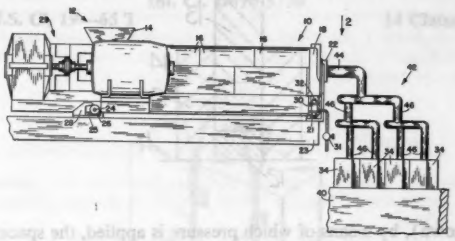
3,619,858
INSERT CONVEYING DEVICE FOR AN INJECTION MOULDING MACHINE
Brian Leo Chudleigh Sutch, Great Bookham, England, assignor to Kingston Plastics Limited
Filed Mar. 27, 1969, Ser. No. 811,042
Claims priority, application Great Britain, Mar. 27, 1968, 14,644/68
Int. Cl. B29c *1/00*
U.S. Cl. 18—5 R **7 Claims**



A mould insert feeding mechanism wherein a head which is coupled to a variable pressure source of gas is movable between an insert loading station and an insert discharge station, drive means being provided to move the head at the loading station to an extraction position at which the head is adjacent an insert store and at the discharge station to a delivery position adjacent a mould cavity, the store including means to sequentially offer inserts to the head and a control being provided to operate the drives and the pressure source to carry out location of an insert in a mould as a part of a moulding cycle.

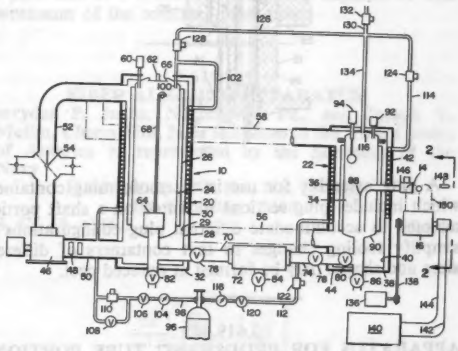
3,619,859
EXTRUSION APPARATUS
Alden W. Nelson, West Mystic, Conn., assignor to Crompton & Knowles Corporation, Worcester, Mass.
Filed Dec. 1, 1969, Ser. No. 881,037
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 R **10 Claims**

An extrusion apparatus wherein one or more extrusion dies are located at a vertical distance from a generally horizontally elongated extruder having an entrance end and an exit end connected to the die by a manifold pipe system. The extruder is pivotally supported and balanced so that thermal expansion of the manifold pipes will lift the exit end of the extruder barrel with a minimum of stress on the pipes. Means are also provided to allow for horizontal thermal expansion of the extruder along its length from its exit end and means such as an air cylinder



or spring are provided for supporting the unbalanced moment of the extruder where the extruder is slightly unbalanced.

3,619,860
APPARATUS FOR PRODUCING PLASTIC FILM
Marvin E. Wallis, San Luis Obispo, Calif. (873 S. Kellog Ave., Goleta, Calif. 93017)
Filed May 2, 1969, Ser. No. 821,203
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 SJ **10 Claims**

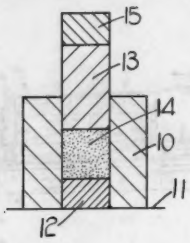


In a method and apparatus for producing plastic film, the step of and means for forming viscous thermoplastic resin into a film, the step of and means for heating a thermoplastic resin to a viscous liquid state, and the step of and means for supplying the heated viscous thermoplastic resin to the film-forming means under substantially constant pressure.

3,619,861
DIE AND PUNCH SETS
Roland John Lumby, Northfield, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Jan. 21, 1969, Ser. No. 792,608
Claims priority, application Great Britain, Jan. 22, 1968, 3,220/68
Int. Cl. B30b *11/02, 15/06*
U.S. Cl. 18—16 R **1 Claim**

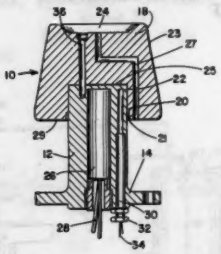
A die and punch set for pressure sintering refractory non-metallic material comprising a hollow die, a punch intended to enter the interior of the die to compress powdered material therein, a plug against which the material

is compressed by the punch and a spacer between the punch and the portion of the associated machine (not



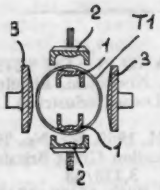
shown), by means of which pressure is applied, the spacer being formed from silicon nitride.

3,619,862
THERMOFORMING PLUG ASSEMBLY
Sidney Cholmar, Bloomfield, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 23, 1968, Ser. No. 786,282
Int. Cl. B29c *1/00*
U.S. Cl. 18—19 P **4 Claims**



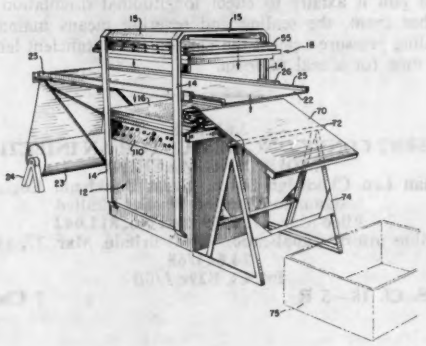
A plug assembly for use in thermoforming containers which includes plug sections mounted on a shaft portion adapted to accommodate different plug configurations to simplify tooling changes so that containers of different sizes and shapes may be formed at reduced cost.

3,619,863
APPARATUS FOR PRODUCING TUBE PORTIONS OF NON-CIRCULAR CROSS-SECTION
Dina Ciabani, 3 Via Donatello, Parma, Italy
Filed Aug. 14, 1969, Ser. No. 850,097
Claims priority, application Italy, Aug. 23, 1968, 7,264/68, Patent 841,636
Int. Cl. B29c *17/02*
U.S. Cl. 18—19 TM **8 Claims**



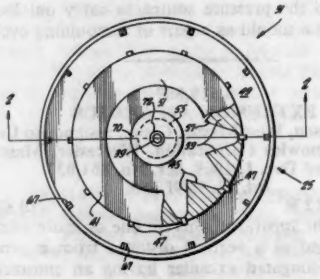
A tube portion of non-circular cross-section, and of thermoplastic material, is produced by shaping a prefabricated tube portion of circular cross-section. The shaping takes place under the action of heat, using stretching and pressing co-operating mould parts. During shaping the sides of the tube portion are curved inwardly so that they are caused to assume plane form by cooling and shrinking.

3,619,864
THERMOPLASTIC SHEET FORMING MACHINE
David W. Birch, East Aurora, N.Y., assignor to Essex Recon Corporation, Lancaster, N.Y.
Filed Sept. 24, 1969, Ser. No. 860,674
Int. Cl. B29c *17/04, 17/10*
U.S. Cl. 18—19 F **4 Claims**



A thermoplastic sheet molding machine is provided, comprising a perforated top table supporting a molding pattern; the interior of the table being subjected selectively and alternatively to vacuum and pressured air condition. A plastic sheet transport frame is provided including means for gripping opposite side edges of a stock sheet to be molded and holding it in horizontal attitude above the table. A radiant heater is mounted above the transport frame, and the power supply means is separately operable to move the transport frame and heater vertically on the machine relative to the table. A vacuum source and a cooling air supply are selectively operable through the table and act upon the sheet in process to provide an improved thermoplastic sheet molding operation.

3,619,865
CENTRIFUGAL IMPREGNATOR APPARATUS FOR IMPREGNATING ELECTRICAL COMPONENTS
Harry I. Hazzard, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.
Filed Mar. 12, 1969, Ser. No. 806,520
Int. Cl. B29c *5/04*
U.S. Cl. 18—26 RR **9 Claims**



A motorized centrifugal impregnator insulates and mechanically pots coils and the like by centrifuging resin and catalyst into the interior of the coils' casings. The

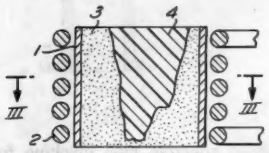
casings are mounted with their interiors to be filled facing radially inward on a circle about the rotational axis of the impregnator. An inner, generally flat surface of the impregnator is surrounded by equally spaced dividers which define distribution passages or channels leading to each coil casing. The passages are configured to produce radial resin and catalyst flow without resin pocketing. A lip or tube at the outer radial limits of each channel direct the resin into the coil casings. Resin and catalyst poured onto the inner surface are thoroughly mixed and distributed to the coils with the resin compound being equally divided by the equally spaced divider walls.

3,619,866

MAGNETIZABLE MASS CASTING DEVICE

Richard Hofmann, Oberscheld, and Adalbert Wittmoser, 684 Lampertheim, Germany; said Hofmann assignor to said Wittmoser

Continuation of application Ser. No. 680,698, Nov. 6, 1967. This application Mar. 31, 1970, Ser. No. 22,125
Claims priority, application Germany, Nov. 11, 1966, H 60,967
Int. Cl. B29c *1/16;* B22d *27/02*
U.S. Cl. 18—34 R **6 Claims**



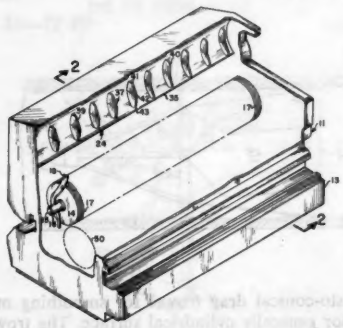
A mold of particulate material including magnetizable particles is made shape-retaining by subjecting the shaped mold to a magnetic field of sufficient strength to fix the position of the particulate magnetizable mold-forming material.

3,619,867

SEED COTTON ROLL BOXES FOR COTTON GIN STANDS

John A. Hays, Mercedes, Tex.
(P.O. Box 795, Raymond, Tex. 78580)

Continuation-in-part of application Ser. No. 707,891, Feb. 23, 1968. This application Mar. 23, 1970, Ser. No. 21,761
Int. Cl. D01b *1/08*
U.S. Cl. 19—55 **4 Claims**



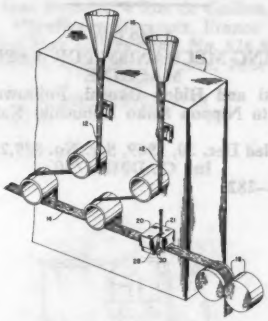
An improved roll box for cotton gin stands incorporating vanes in the scroll sheet of the roll box for laterally shifting the seed cotton roll over the ginning ribs and saws with the purpose of increasing the ginning rate, reducing spindle twist and improving staple quality.

3,619,868

METHOD AND APPARATUS FOR ASSIMILATING A YARN END IN TOW

Merton L. Dibble, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1970, Ser. No. 3,742
Int. Cl. D01b *3/10*
U.S. Cl. 19—65 T **14 Claims**



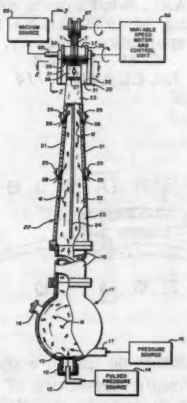
Method, and apparatus for practicing the method, for assimilating a moving yarn end of filamentary material into a moving tow by entangling individual filaments of the yarn end with filaments of portions of the tow by false twisting such filaments, and automatically cutting the yarn end at a location immediately adjacent to and downstream of the resulting false twist.

3,619,869

FIBER ALIGNING APPARATUS

Rimvydas P. Jakas, Norristown, Pa., and Joseph V. Mullin, Cherry Hill, N.J., assignors to the United States of America as represented by the Secretary of the Navy

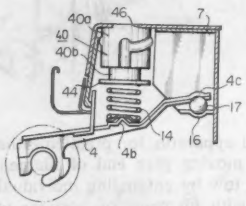
Filed Jan. 2, 1969, Ser. No. 789,103
Int. Cl. D01g *25/00*
U.S. Cl. 19—156.3 **15 Claims**



Apparatus for aligning fibers such as α-alumina whiskers and for forming strands or tapes of the longitudinally-aligned whiskers including a cone; pneumatic apparatus for delivering the whiskers to the cone; and endless, transversely movable, permeable belt for collecting aligned

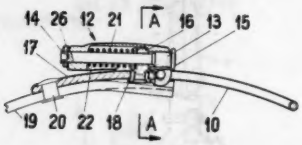
whiskers for the cone; a vacuum head positioned for accelerating the delivered fibers through the cone for collection on the belt; and stripping apparatus for collecting the tapes of longitudinally-aligned whiskers wherein the cone includes slots for establishing a whisker-accelerating flow field directed toward the belt and an influx slot for establishing a transverse flow immediately adjacent the belt causing the whiskers to be reoriented in a plane including the direction of belt movement immediately prior to collection.

3,619,870
DRAFTING MECHANISM FOR A SPINNING MACHINE
Nobugi Ooki and Hideo Okoshi, Fujisawa-shi, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 30, 1969, Ser. No. 889,250
Int. Cl. D01h *5/50*
U.S. Cl. 19—282 **3 Claims**



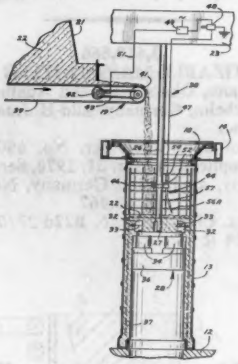
An improvement of the common carrier arm utilized for drafting mechanisms of a spinning machine. The carrier arm of the invention is provided with guide arms which are supported in a three dimensionally supporting condition thereon and with adjustable spring loading means of top rollers which permits changes in pressure with which the top rollers are urged against in cooperating bottom rollers.

3,619,871
ADJUSTABLE SHOE CLOSURE DEVICE HAVING A SPRING SHACKLE
Robert Schoch, Singen-Hohentwiel, Germany, assignor to Wienman A.G., Schaffhausen, Switzerland
Filed Aug. 24, 1970, Ser. No. 66,289
Claims priority, application Germany, Aug. 29, 1969, G 69 34 052.9
Int. Cl. A43c *11/14*
U.S. Cl. 24—68 SK **4 Claims**



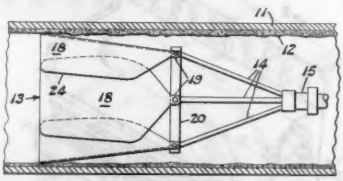
An adjustable closure device for a shoe upper has two inter-engageable closure means, one of which includes a pin disposed in a housing and is axially movable with the housing between a rest position and an extended position and immovable longitudinally relative to the housing, and resilient means in the housing biasing the pin to the rest position. A support plate is mounted on the shoe upper and carries a turnable post; the post projects through an opening into the interior of the housing, the pin is in slidable engagement with the post and revolvable therewith, thereby pivoting the housing relative to the support plate.

3,619,872
FEED CONTROL FOR CONCRETE PIPE MACHINE
Navarro T. Fosse, Nashua, Iowa, assignor to Hydrotile Machinery Company, Nashua, Iowa
Filed July 22, 1969, Ser. No. 843,588
Int. Cl. B28b *21/26*
U.S. Cl. 25—36 **25 Claims**



A packer head concrete pipe machine for making a cylindrical concrete pipe in an upright mold. Concrete is moved from a hopper by a conveyor into an upright mold on top of a rotatable packer head. A power driven carriage operates to move the rotatable packer head upwardly to continuously move and pack the concrete outwardly against the cylindrical mold to form the cylindrical pipe. A control means, operable to sense the amount of concrete on the packer head, controls the conveyor speed, or starts and stops it, so that a substantially constant supply of concrete is available over the packer head.

3,619,873
TROWEL FOR PIPE LINING MATERIAL
Albert G. Perkins, Watkins Glen, N.Y., assignor to Perkins Pipe Linings, Inc., Watkins Glen, N.Y.
Filed July 31, 1969, Ser. No. 846,380
Int. Cl. B28b *21/18*
U.S. Cl. 25—38 **10 Claims**



A frusto-conical drag trowel for smoothing mortar in an interior generally cylindrical surface. The trowel body comprises laterally overlapping plate members and a mounting member at the small end of the frusto-conical travel body. The adjacent end of each trowel plate is pivoted to the mounting member on an axis extending radially of the trowel body to permit relatively free intersliding movement of adjacent overlapping trowel plates

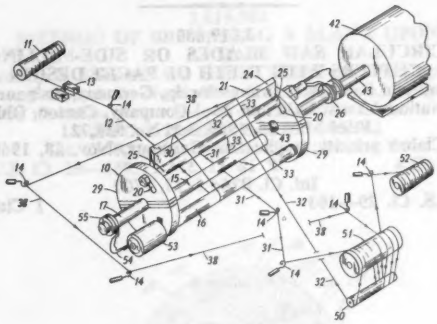
at the large end of the trowel body and such adjacent end of each trowel plate being relatively flexible whereby each of the trowel plates may swing about an axis generally tangent to the mounting member to vary the diameter of the large end of said trowel body. Resilient means are provided within the large end of the trowel body to exert a perimeter-increasing force at said large end for resiliently urging the plate members radially outwardly to urge their trailing ends into yieldable troweling contact with the mortar.

3,619,874

TRAVELLING-EDGE CRIMPER AND PROCESS

Hsin Lang Li, Parsippany, and Dusan C. Prevorsek and Hendrikus Johan Oswald, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 16, 1970, Ser. No. 3,444
Int. Cl. D02g *1/10*
U.S. Cl. 28—1.5 10 Claims



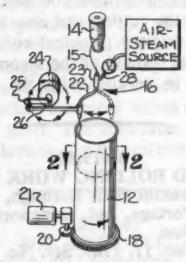
A thermoplastic yarn is crimped at increased speeds by guiding a running length of the yarn under controlled tension and temperature at an acute angle over an edge in an apparatus in which the crimping edge itself travels in a direction with the moving yarn.

3,619,875

METHOD OF PROCESSING THERMOPLASTIC YARN

Terry Lee Gates, McAdenville, N.C., assignor to Pharr Yarns, Incorporated, McAdenville, N.C.

Filed Mar. 9, 1970, Ser. No. 17,498
Int. Cl. B65h *55/04*
U.S. Cl. 28—72 SP 8 Claims



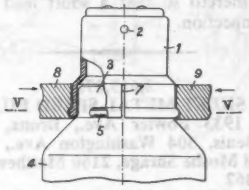
A method of handling a pre-bulked yarn during a process involving heat treatment in a manner to maintain uniformity of bulk. The process comprises the steps of forming the yarn into a loose mass, enclosing the yarn mass within a flexible bag, heat treating the yarn while it is positioned within the bag, and finally withdrawing the heat treated yarn from the bag and winding it into a more condensed package form.

3,619,876

METHOD OF MANUFACTURING ELECTRIC LAMPS, BASES FOR CARRYING OUT SAID METHOD AND LAMPS THUS OBTAINED

Jean Besacier, 4 Rue de Gaillon, Marolles-en-Hurepoix, France

Filed May 22, 1969, Ser. No. 826,858
Claims priority, application France, June 14, 1968, 155,078
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.13 2 Claims



A method of manufacturing an electric lamp of which the bulb has formed in its neck portion a pair of separate grooves extending in a common transverse plane. According to said method each lamp base is made of a suitable flexible material by forming in the base skirt on the one hand a pair of internal anchoring beads adapted to fit into the grooves of the bulb neck and on the other hand one or two longitudinal slits. Then, this base is fitted to the bulb neck by momentarily expanding the portions of the base skirt which are formed therein by said slit or slits, so that the internal anchoring beads of said skirt can fit into the grooves of the bulb neck. Finally, the edges of the longitudinal slit or slits formed in the base skirt are sealed together.

This disclosure is also concerned with lamp bases designed for carrying out the manufacturing method set forth hereinabove, and with electric lamps manufacturing by carrying out this method.

3,619,877

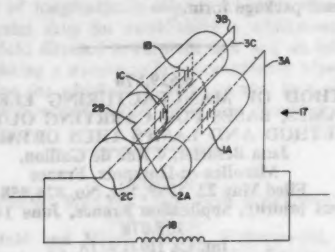
CAPACITOR ASSEMBLY

Wilbur O. Hansen, Waynesboro, Va., assignor to General Electric Company

Original application Jan. 22, 1968, Ser. No. 699,399, now Patent No. 3,527,988, dated Sept. 8, 1970. Divided and this application Feb. 2, 1970, Ser. No. 7,624
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.41 2 Claims

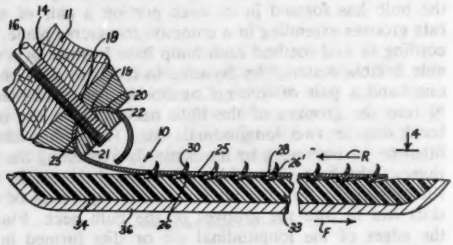
A capacitor assembly having a large heat transfer surface and housing a plurality of capacitors which may be connected as a lumped capacitance. A plurality of thermally conductive tubes are mounted substantially parallel, adjacent tubes contacting each other to define passages for a cooling medium. At least one capacitor is supported within each tube. The capacitors are thermally connected to the walls of the tubes in which they are contained in order to provide for heat transfer thereto. Leads extending from capacitor terminals may protrude from opposite ends of each tube. The tubes may also be electrically conductive so that capacitors may be conveniently connected in parallel by electrically connecting one terminal of each capacitor to the wall of the tube in which it is contained and the other terminal of each capacitor to a common

wire. Wires to which the other terminal of each capacitor is to be connected may pass through each tube in spaced



relationship thereto so that a short lead is required to make the connection.

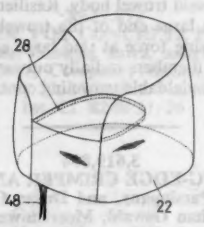
3,619,878
SHEET METAL SPEED FILE
Isak Benis, 1933 Fowler Ave., Bronx, N.Y. 10462; William Benis, 304 Washington Ave., Tappan, N.Y. 10983; and Moshe Shrage, 2160 Matthews Ave., Bronx, N.Y. 10462
Filed Dec. 2, 1969, Ser. No. 881,480
Int. Cl. B23d *71/00*
U.S. Cl. 29—78 **9 Claims**



A tool for smoothing a hardened plastic filling in an indentation of a vehicle body, includes a handle, a flexible sheet metal cutter plate and attachment means for detachably and replaceably securing the plate to the handle. The cutter plate has sharp, inclined semicircular teeth struck out of one side of the plate. Holes adjacent the teeth pass chips cut loose by the teeth. The flexible plate conforms to the curvature of the vehicle body. The unflexed plate may be flat or curved. The plate may be longer than it is wide with the direction of length perpendicular or parallel to the handle. The teeth extend in the direction of length of the cutter plate.

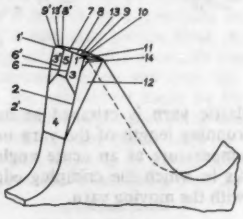
3,619,879
METHOD OF UPHOLSTERING
Katsuya Shirakawa, % Katsuyi Sawara, patent atttorney, 50 Jokiura-Bank Bldg., 5, 4-chome, Iidabashi, Tokyo, Japan
Filed Apr. 27, 1970, Ser. No. 32,095
Int. Cl. B68g *7/00*
U.S. Cl. 29—91.1 **4 Claims**

A method of upholstering a chair of almost any desired shape by employing a zipper or a fastener which is attached to the padding or body of the chair and to the backside of the covering cloth or upholstery, including the technique of attaching a fastener to the chair body when the synthetic foaming material is made into the chair body of the desired shape by being injected into a mold, and the technique of contouring the upholstery tightly to the chair body not by seaming but by employing a fastener. This method makes it possible to cover the chair body



tightly even if it is concave in the center like a shell, though it was difficult or impossible to upholster the concave body tightly by seaming work.

3,619,880
CIRCULAR SAW BLADES OR SIDE-MILLING CUTTERS WITH TEETH OF FACET DESIGN
Gotthold Pahlitzsch, Braunschweig, Germany, assignor to National Twist Drill and Tool Company, Canton, Ohio
Filed Mar. 25, 1969, Ser. No. 838,721
Claims priority, application Germany, Nov. 28, 1968, P 18 11 374.1
Int. Cl. B26d *1/12, 1/00*
U.S. Cl. 29—103 **1 Claim**

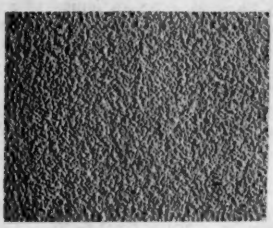


This invention concerns improved cutting teeth for circular disk shaped tools such as circular saws or side-milling cutters for cutting or slot-milling or for key-way milling of metallic material. The cutting teeth include bevels or facets arranged symmetrically relative to the saw blade middle plane so that the corners of the cutting surface are trailing behind the composed principal cutting edges in the cutting direction and are essentially reinforced through the cutting and clearance angle which is altered over the original principal cutting edge, and that guiding planes are formed at the secondary cutting edges which are lying in parallel with the saw blade middle plane.

3,619,881
COLD ROLLING WORK ROLL
Max E. Bills, Pleasant Hills Borough, Pa., and Henry J. Hansen, Jr., Portage, Ind., assignors to United States Steel Corporation
Filed Jan. 17, 1969, Ser. No. 792,079
Int. Cl. B21b *27/02*
U.S. Cl. 29—121 R **5 Claims**

A work roll for cold rolling steel sheets or strip has a plurality of shallow generally frustospherical depressions in its outer surface. The vast majority of the depressions are of substantially uniform shape and depth, but may be randomly spaced over the roll surface. When the sheet

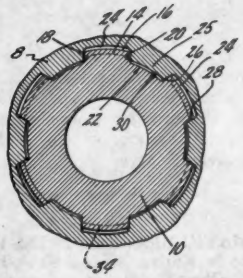
is rolled between two rolls, at least one of which has the described surface, low generally frustospherical projections of substantially uniform shape and height are obtained on that side of the strip in contact with the surfaced roll.



3,619,882
METHOD OF BROACHING A BLANK UPON A SHAFT

Stanley J. Sobanski and Otil F. Mastriforte, Newington, and Godwin L. Noell, New Hartford, Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Oct. 27, 1969, Ser. No. 869,641
Int. Cl. B21d *53/28;* B21h *5/00;* B21k *1/30*
U.S. Cl. 29—159.2 4 Claims



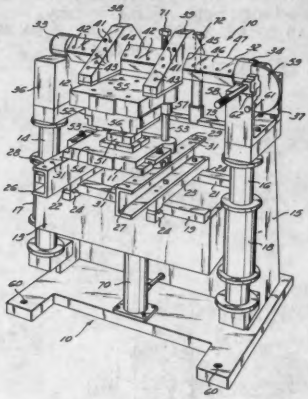
A steel shaft having peripheral lands is broached by a splined carbide blank to form a broached assembly having interfaces between the lateral flanks of the lands and lateral flanks of the splines. The inner and outer peripheral portions of the steel shaft are spaced from the carbide blank to prevent radial stresses from being produced during broaching and to accommodate thermal expansions in the broached assembly. Circumferential chip grooves are provided in that portion of the shaft which is to be broached by the carbide blank to prevent continuous chips from forming during the broaching process which could seize on the cutting face of the carbide blank. The carbide blank of the broached assembly resists displacements relative to the steel shaft. The interfaces may be angularly disposed to alleviate large circumferential thermal stresses.

3,619,883
DIE ASSEMBLER

Herbert J. Venables III, Cleveland, Ohio, assignor to The Venables Machine and Tool Company, Cleveland, Ohio

Filed June 9, 1969, Ser. No. 831,525
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 R 6 Claims

An apparatus to facilitate the assembly of die sets including a vertically movable carriage to which a die holder may be provisionally mounted and a support shaft to which an opposite die holder may be correspondingly mounted. The shaft is horizontally offset from the carriage

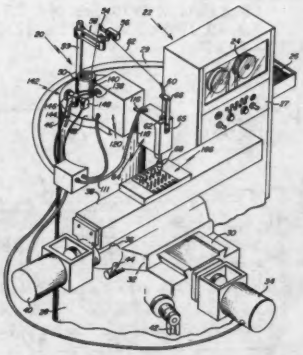


area to support its associated die holder assembly either directly above the other die holder assembly for fitting or in a horizontally displaced position to permit access to the inner surfaces of both assemblies.

3,619,884
APPARATUS FOR PERFORMING A PLURALITY OF WINDINGS

Harold W. Bennett, Stoughton, and Barry E. Richards, Marlboro, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 30, 1969, Ser. No. 837,628
Int. Cl. H05k *13/04;* B23p *19/04*
U.S. Cl. 29—203 MW 8 Claims



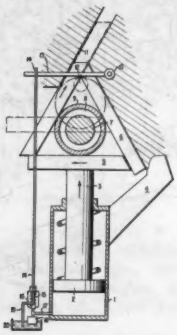
A wiring apparatus including a control console having means for receiving a programmed series of instructions and a wiring machine electrically controlled by the console and having means for continuously moving a fixture below a simultaneously movable head carrying a tube through which a continuous wire is paid out onto the fixture, said fixture having means for guiding the wire through core positions and across terminal pads carried on the fixture.

3,619,885

VARIABLE-DIAMETER CRIMPING TOOL

Helmut Dischler, Neuss-Uedes-Heim, Germany, assignor to Novopress G.m.b.H. & Co. KG., Dusseldorf, Germany

Filed Nov. 18, 1969, Ser. No. 877,802
Claims priority, application Germany, Nov. 20, 1968, P 18 09 853.8; Aug. 11, 1969, P 19 40 854.9
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D 13 Claims



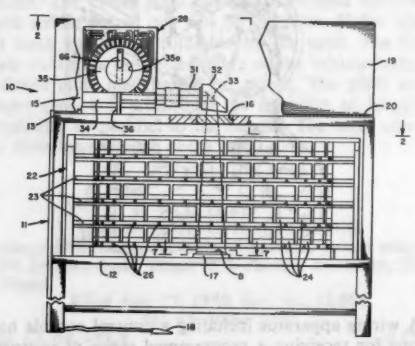
A device to assemble electrical connectors, cable shoes, fittings and sleeves onto electric conductors, cables, wire ropes, rods and ropes of different nominal sizes and diameters, by a crimping deformation operation where the correct depth of crimping and clamping deformation is automatically determined. The crimping jaw arrangement of said device is generally triangular in shape and is either power-hydraulically or manually plier-like actuated in a rapid approach and slow crimping and penetrating operating cycle.

3,619,886

OPTICAL ASSEMBLY SYSTEM

Herbert A. Sauvé, Santa Cruz, and David C. O. Sloan, Boulder Creek, Calif., assignors to Sylvania Electric Products Inc.

Filed Feb. 2, 1970, Ser. No. 7,742
Int. Cl. H05k *13/04*; B23g *17/00*
U.S. Cl. 29—203 B 11 Claims



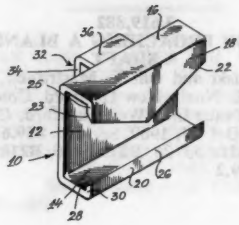
The system comprises a standard slide projector arranged to project images of components from transparent slides to a workpiece, such as a printed circuit board, on a worktable. A plurality of storage bins containing different components and located close to the work area have indicator lights under the bins, respectively, and are connected to a power source through a multi-contact switch plate mounted adjacent to the rotatable slide holder of the projector. Movable contacts on a slide in the holder successively close switches to lamps adjacent to respective bins containing components corresponding to component images on the slides in the order in which those images are projected to the workpiece. Component location on the workpiece, the shape of the component and identification of the storage bin which contains it are communicated simultaneously to the assembler.

3,619,887

TOOL FOR FORCIBLY REMOVING A CYLINDER FROM A LOCK

William M. McLaughlin, 3400 Fort Independence St., Bronx, N.Y. 10463

Filed Oct. 9, 1969, Ser. No. 865,143
Int. Cl. B23p *17/04*
U.S. Cl. 29—207 2 Claims



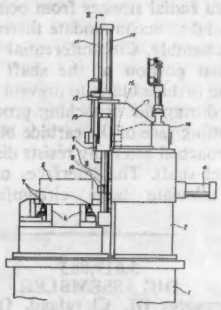
A tool for removing a cylinder from a lock in a door has a channel shaped body formed with beveled flanges to engage behind the rim of the cylinder. A loop on the back of the tool engages an implement for drawing the tool away from the door with the cylinder engaged between the beveled flanges.

3,619,888

AUTOMATIC BEARING PRESS-FIT MACHINE

Kingo Sawada, Kariya, Shoichi Kato, Hekikai, and Tadashi Ota, Okazaki, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

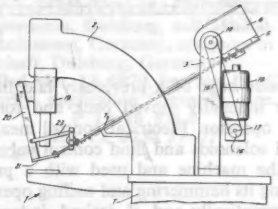
Filed Feb. 20, 1970, Ser. No. 12,975
Claims priority, application Japan, Dec. 28, 1969, 44/505
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—208 9 Claims



An automatic bearing press-fit machine including bearing indexing means for indexing the oil hole of a bearing in a predetermined angular position, bearing inserting

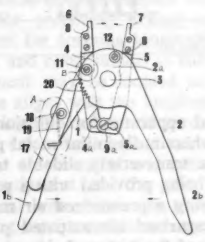
means for inserting the bearing indexed by the indexing means into the bore of a workpiece in press-fit relationship, and bearing position-ensuring means for ensuring the alignment of the oil hole of the bearing inserted into the bore of the workpiece with respect to that of the workpiece.

3,619,889
APPARATUS FOR AFFIXING SMALL DISCRETE ARTICLES TO SUPPORTS
Maurice M. Balsam, 27 W. 24th St., New York, N.Y. 10010
Filed Oct. 2, 1969, Ser. No. 863,212
Int. Cl. B23g 7/10; B23p 19/04
U.S. Cl. 29—208 R **10 Claims**



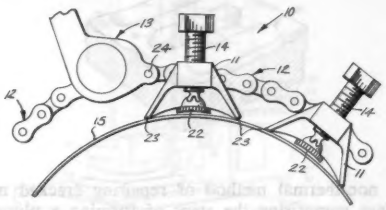
A hopper has a bottom wall downwardly inclined and provided with an opening of predetermined outline. A slideway extends from below the opening downwardly inclined, and has a lower end portion. Guide means is provided on the slideway so as to receive and position for sliding movement articles which are accommodate in the hopper, and which are ejected therefrom with predetermined orientation through the opening in the bottom wall by an agitating device arranged in the hopper. A die is located adjacent the lower end of the slideway for affixing the articles moving along the slideway to a support, such as a woman's handbag or the like. Means is provided for letting only the respectively leading article on the slideway advance to the die while retarding or restraining the others on the slideway until the respectively leading article has been processed, such as by being affixed via the die to a support.

3,619,890
PLIERS FOR STOP RINGS
Masaharu Kubokawa, 3–11–8 Minaminagasaki, Toshima-ku, Tokyo, Japan
Filed Mar. 4, 1970, Ser. No. 16,401
Claims priority, application Japan, Nov. 11, 1969, 44/90,640
Int. Cl. B25b; B23p 19/04
U.S. Cl. 29—229 **7 Claims**



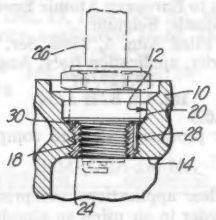
Pliers for stop rings having two handles pivotally connected to each other, and two blade supporting members each having a blade mounted thereon. The blade supporting members are pivotally connected and may each be coupled to either handle. When the two handles are moved toward each other, the blades are moved either toward or away from each other depending on the coupling arrangement. A stop ring for a hole and a stop ring for a shaft can be fitted in a hole and a groove formed on the surface of a shaft respectively by using the pliers according to this invention.

3,619,891
PIPE CLAMP
John William Harrison, 1362 Rose Ave., South Fort George, British Columbia, Canada
Filed May 27, 1969, Ser. No. 828,144
Int. Cl. B25b 27/14
U.S. Cl. 29—272 **2 Claims**



A clamp arrangement for use in working steel pipe, the main advantage being that the device will fit all sizes of pipe. This device consists of a multiple number of aligning blocks which are slid along a roller chain held securely in place by a ratchet. The device includes a multiple number of adjusting screws which when they are slackened off will permit another pipe to abut with the pipe device placed upon it in order for them to be welded together.

3,619,892
METHOD OF REPLACING DEFECTIVE SPARK PLUG HOLE THREADS
Ronald C. Roeschlaub, Los Angeles, Calif., assignor to Irontite Products Co. Inc., El Monte, Calif.
Filed Feb. 9, 1970, Ser. No. 9,518
Int. Cl. B23p 7/00
U.S. Cl. 29—401 **4 Claims**

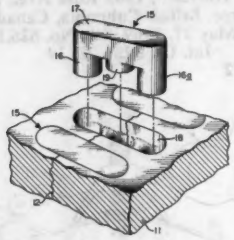


A method of replacing defective threads in a spark plug hole in a cylinder head, or the like, including the steps of: reaming out the defective threads to form an enlarged hole; tapping the enlarged hole; threading into the tapped hole an annular insert which is threaded internally to receive a spark plug of the same size as the original hole; locking the annular insert against rotation; and deforming a sealing washer into sealing engagement with the outer end of the annular insert and the cylinder head. The annular insert is then ready to receive a spark plug of the same size as the original hole, the spark plug being seatable on the sealing washer to render the spark plug gas tight under all pressure conditions within the cylinder.

3,619,893
METHOD OF REPAIRING CRACKED METALLIC CASTINGS

Cleon B. Harris, 1732 Sherwood Forest Blvd., Baton Rouge, La. 70815

Continuation-in-part of abandoned application Ser. No. 653,194, July 13, 1967. This application Sept. 8, 1969, Ser. No. 867,106
Int. Cl. B22d 19/10
U.S. Cl. 29—402 3 Claims



A non-thermal method of repairing cracked metallic castings comprising the steps of forming a plurality of spaced openings laterally across the crack, removing metal from the upper portion of the openings thereby forming a groove interconnecting the upper ends of the openings and forming ribs therebetween, the walls defining the sides of the groove of a straight configuration, the opening directly intersected by the crack being substantially of less depth than the openings spaced apart on each side thereof, then depositing a load-bearing, deformable, non-thermal bonding metal element in the groove so that the entire groove and openings are completely filled. The bonding metal is strengthened and the metal element—casting wall joint is made pressure-tight by cold working the bonding metal. Preferably, a plurality of openings and grooves are formed along the crack in the above manner.

3,619,894
PROCESS FOR THE PRODUCTION OF A COMPOSITE MATERIAL Al-Mg-Al_2O_3-MgO

Dante Gualandi, Arona, and Pierre Jehenson, Varese, Italy, assignors to European Atomic Energy Community (Euratom), Brussels, Belgium

No Drawing. Filed Aug. 6, 1968, Ser. No. 750,462
Claims priority, application Italy, Aug. 31, 1967, 39,127/67
Int. Cl. B22f 3/24
U.S. Cl. 29—420.5 2 Claims

A method for producing sintered composite

Al-Mg-Al_2O_3-MgO

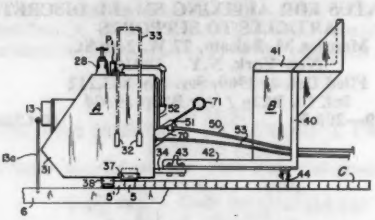
material for nuclear applications, comprising grinding an Al-Mg alloy powder in air using an aluminum mill and a grinding lubricant, cold compressing the ground powder, effecting a controlled oxidation to form a double oxide Al_2O_3-MgO product; sintering and degasifying the product, hot compressing and then extruding the product.

3,619,895
NAILING MACHINE FOR WOOD FLOORING

Einar T. Thompson, 107 White Gate Road, Pittsburgh, Pa. 15238

Filed May 13, 1969, Ser. No. 824,226
Int. Cl. B27f 7/02
U.S. Cl. 29—432 13 Claims

A floor laying machine is provided having a hammer for forcing flooring members into and retaining them in a tight interlocked tongue and groove fitted relation while a nailer is employed for securing the members in position with respect to each other and on sleepers or joists. The machine is moved on a previously laid floor portion, longitudinally of a floor member to be laid, to secure it to the sleepers or joists and to a previously laid member; the machine has vertical roller means for guiding it along

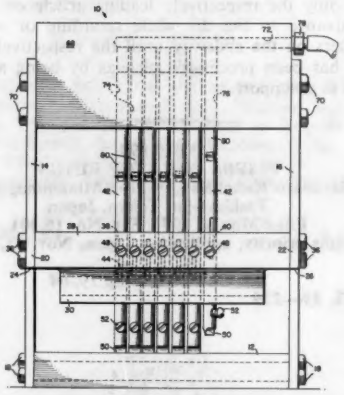


an exposed side edge of a previously laid floor member and may be manually moved back and forth across a room by an operator. Electrical control means including switches and solenoids and fluid control valve means are carried by the machine and used with a pressure fluid for controlling its hammering and nailing operations manually or automatically and, if desired, independently.

3,619,896
THERMAL COMPRESSION BONDING OF INTERCONNECTORS

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration, in respect to an invention of David R. Clarke, Bellevue, Wash.

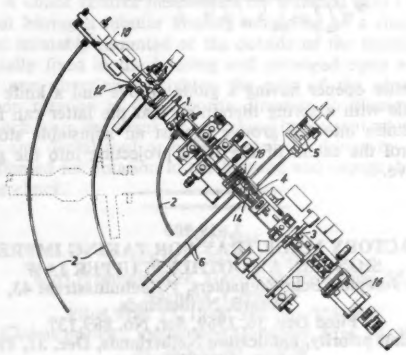
Filed Feb. 27, 1969, Ser. No. 802,813
Int. Cl. B23k 31/02
U.S. Cl. 29—473.1 3 Claims



A method and apparatus for diffusion bonding of dissimilar metals wherein dissimilar metal parts to be joined are placed on a transversely slidable tray located on a table, the table being provided with a pair of spaced uprights and carrying a pressurized air manifold having a plurality of pressurized air actuated pistons depending therefrom, each of the pistons being provided at its end thereof with a refractory material of spherical configuration. In vertical spaced relationship below the manifold a cross arm is supported between the pair of upright rails. The cross arm, slidably supports a plurality of vertical plungers, each of which is provided with a longitudinal

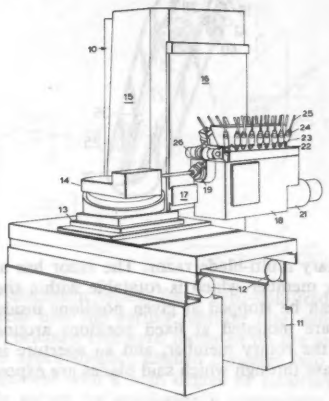
slot for receiving the end of a set screw that retains each plunger on the cross arm. One end of each plunger engages a respective spherical end portion of a piston, the other end of the plunger being of wedge configuration and adapted to clamp the dissimilar metals to be joined between it and the top surface of the tray. The table and the cross arm are each provided with laterally extending bores therethrough for accepting a cartridge type resistance heater. The assembly is placed within an evacuation chamber wherein the dissimilar metal parts are diffusion bonded by the application heat and force transmitted through the table and the wedge-shaped end portion of the plungers.

3,619,897
ARRANGEMENT FOR A WELDED TUBE FORMING MACHINE
Wilhelm Oppermann, Duisburg, and Johann Vogt, Duisburg-Wanheimerort, Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany
Filed Mar. 13, 1970, Ser. No. 19,157
Claims priority, application Germany, Apr. 24, 1969, P 19 20 871.0
Int. Cl. B23k *31/02*
U.S. Cl. 29—475 **6 Claims**



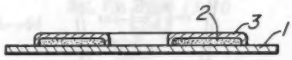
An arrangement for a welded tube forming machine includes a straight trackway forming a center point at one location for a curved trackway. The curved trackway is adapted to carry the necessary equipment for preparing strip material for forming it into a tube. This equipment may be moved on the curved trackway through an arc so that its longitudinal center line may be aligned with the longitudinal center line of tube finishing equipment, or arranged at a selected angle in respect thereto. The straight trackway provides means for shifting forming equipment for preparing helical seam tubes and forming equipment for forming longitudinal-seam tubes. The arrangement and construction as such that the strip preparing equipment may be located so that its longitudinal center line aligns with the longitudinal center line of the tube-finishing apparatus and in such instance the forming equipment for the longitudinal seam welding is interposed on the trackway at a location between the strip preparing equipment and the tube finishing equipment. When helical seam tubes are to be welded, then the strip preparing equipment is arranged at a selected angle in respect to the longitudinal center line of the tube finishing equipment and the forming equipment is shifted on the trackway until the forming equipment for preparing helical seam tubes is located between the strip preparing and tube finishing equipment, that is at a location to receive the strip material which has been prepared for the formation of the helical welding seam and then for delivering it, after welding, to the tube finishing equipment.

3,619,898
MACHINE TOOL
Charles B. Perry and Herman Horlacher, Cincinnati, Ohio, assignors to The Cincinnati Milling Machine Company, Cincinnati, Ohio
Filed Aug. 11, 1969, Ser. No. 849,107
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **7 Claims**



This invention relates to a machine tool and, more particularly, to a machining apparatus having tool changing capabilities wherein a double-armed interchanger carries successive tools from a tool storage matrix to a working spindle.

3,619,899
METHOD OF MAKING A DISK-SHAPED ARMATURE
Naozi Takeda, Osaka, and Tosio Tuzihara, Kobe, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 17, 1969, Ser. No. 885,673
Claims priority, application Japan, Dec. 23, 1968, 43/94,715
Int. Cl. H02k *15/00*
U.S. Cl. 29—598 **3 Claims**

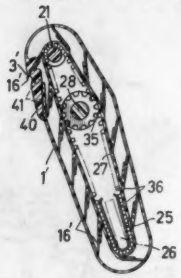


A resin is printed and attached in a doughnut shape onto a copper plate to form an insulating film. A copper film is formed on the insulating film by a non-electrolytic plating method or an evaporation method. Then, the copper plate and the copper film are respectively etched in such a pattern that half turn conductors are arranged by removing the unnecessary portions, thus an armature element is obtained in which single turn conductors in two layers are arranged having an insulating film interposed therebetween. Two such armature elements are stuck together by interposing insulating sheets therebetween and connections are made between their surfaces, thereby manufacturing an armature having two turn conductors in four layers.

3,619,900
ROTARY SPARE BLADE SAFETY RAZOR

Hirotsugu Matsuura, Nara-ken, Japan (35, 8-chome, Nishinocho, Tanabe, Higashisumiyoshi-ku, Osaka, Japan)

Filed Aug. 20, 1969, Ser. No. 851,677
Claims priority, application Japan, Feb. 13, 1969, 44/10,923
Int. Cl. B26b *21/24, 3/00*
U.S. Cl. 30—40 4 Claims

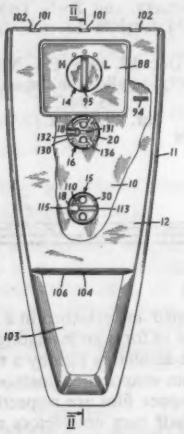


A rotary multi-blade razor. The razor has a case with a rotary member which is rotatable within the case and which can be stopped at given positions inside the case. Blades are mounted at fixed positions around the outside of the rotary member, and an aperture is provided in the case through which said blades are exposed.

3,619,901
RAZOR WITH FLEXIBLE BAND BLADE

Paul A. Braginetz, Augusta County, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,659
Int. Cl. B26b *21/26*
U.S. Cl. 30—40.1 9 Claims

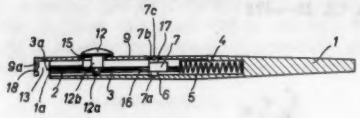


A disposable razor of the flexible band blade type in which the band is adapted to be incrementally and progressively advanced through the shaving area from a pay off spool to a manually rotatable take up spool, the operative elements being mounted in an inner frame, which is contained in a pocket in a cover member elongated to serve as a combined casing and handle, the pocket being formed by side flanges and transverse ribs, the razor having also a back plate extending over the frame and having a flange interlocked with a transverse rib of the front casing part, the razor further embodying a bridge member of elastic sheet material having a U-shape in cross-section and carrying a guard, the position of the guard being adjustable through cam means acting to compress elastically the guard carrying leg of the U-shape relative to the other leg.

3,619,902
LETTER OPENER

Josef Viktor Fleury, Rapperswil, Switzerland, assignor to Mewecco Fleury Mechanische Werkstatte

Filed Mar. 12, 1969, Ser. No. 806,523
Claims priority, application Switzerland, Mar. 15, 1968, 3,914/68
Int. Cl. B26b *29/00*
U.S. Cl. 30—294 6 Claims

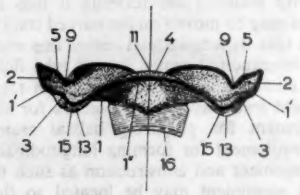


Letter opener having a guide groove and a knife in a handle with a spring therein so that the latter can force the knife into the groove against an adjustable stop to control the extent of the knife projecting into the guide groove.

3,619,903
FACTORY MADE TRAY FOR TAKING IMPRESSIONS ON A TOOTHLESS UPPER JAW

Josephus Schreinemakers, Wilhelminastraat 43, Sittard, Netherlands

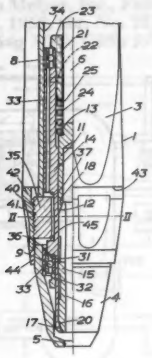
Filed Dec. 30, 1969, Ser. No. 889,137
Claims priority, application Netherlands, Dec. 31, 1968, 6818886
Int. Cl. A61c *9/00*
U.S. Cl. 32—17 9 Claims



A factory made tray for taking impressions on a toothless upper jaw, wherein the distal rim of both vestibular flanges of the tray entirely extends in situ beyond the action limit in the action area of the mucous membrane.

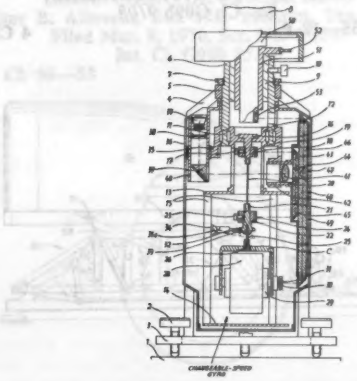
According to the invention the distal rim of both vestibular flanges comprises an upwardly directed kink positioned immediately outward of the relative hamular notch, in such manner that the base of the more or less vertically extending groove between the os maxillare and the external pterygoid plate is reproduced in the impression on the left hand side and on the right hand side in an optimum manner.

3,619,904
CHUCK CONTROL FOR DENTAL DRILLS AND THE LIKE
Karl Ivar Lundgren, Hagersten, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Dec. 19, 1968, Ser. No. 785,178
Claims priority, application Sweden, Dec. 29, 1967, 17,978/67
Int. Cl. A61c *1/10*
U.S. Cl. 32—26 5 Claims



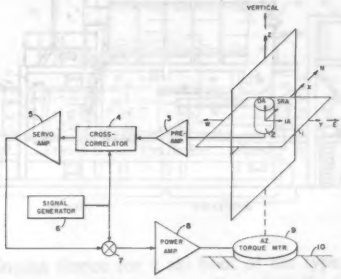
A chuck control mechanism for a dental drill or other tool having a tubular housing consisting of a ring member rotatably mounted at the outside of the housing and axially fixed in the housing and arranged upon rotation in one direction to tighten the grip of the chuck and upon rotation in the opposite direction to disengage the chuck from the shank of a working implement which may be any dental tool or other implement driven by a shaft mounted for rotation in the housing and engageable with the chuck.

3,619,905
GYRO COMPASSES
Karl Heinrich Stier, Hugo-Schultz-Strasse 55, Bochum, Germany
Filed May 13, 1968, Ser. No. 728,461
Claims priority, application Germany, May 13, 1967, St 26,875, St 26,876
Int. Cl. G01c *19/38, 1/02*
U.S. Cl. 33—72 10 Claims



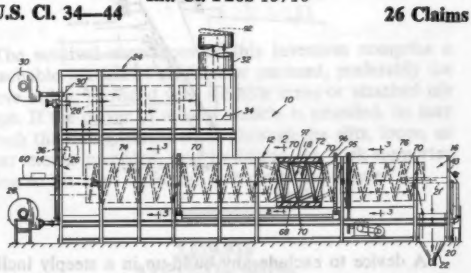
A gyro compass in which one embodiment has an inner gimbal suspended between two band systems of varying restoring torques which can be selectively damped. On the band systems are mounted mirrors, having normals capable of coincidence with optical path of a prism arrangement with enables the autocollimating telescope to optically sight on the mirrors. The combination of the band systems and the mirror results in the capability to find the null position for the compass faster than in a liquid damped compass while retaining the greater accuracy of the liquid damped compass over that of the undamped compass of prior art.

3,619,906
OSCILLATING NORTH-SEEKING PLATFORM
Robert E. Yates and Lester M. Ross, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
Filed May 5, 1969, Ser. No. 821,900
Int. Cl. G01c *19/38*
U.S. Cl. 33—226 2 Claims



A self-alignment system for a gyro-stabilized platform. The system uses the earth's rotation rate, sensed by an east-west oriented rate gyro mounted on the platform, to drive the approximately aligned platform into E–W and N–S alignment with a high degree of accuracy. The accuracy is gained by employing a comparison technique to separate the gyro output signal of earth's rate from the random part of the output caused by imperfection in the gyro. A sinusoidal signal generator actuates an azimuth torque motor to oscillate the platform about a vertical axis. This sinusoidal oscillation and a sinusoidally modulated earth rate with its swings about null not accurately equal combine to form the signal picked off at the vertically oriented output axis of the gyro. This signal is compared with the generator signal and a resulting signal is added to the azimuth torque motor input such as to accurately equalize the platform swings to each side of the true alignment direction.

3,619,907
CHIP DRYER DEVICE
William C. Kallas, Park Ridge, Ill., assignor to Klefstad Engineering Co., Inc., Chicago, Ill.
Continuation of application Ser. No. 720,806, Apr. 12, 1968. This application June 8, 1970, Ser. No. 44,265
Int. Cl. F26b *13/10*
U.S. Cl. 34—44 26 Claims



A system for cleaning and drying metal chips having an air flow moving in an opposed relationship with respect to the movement of the metal chips. A spiral auger conveys the metal chips from an input end to an output end.

3,619,908

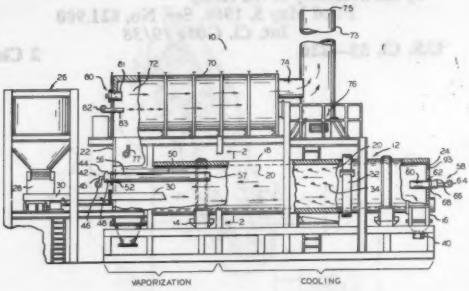
DEVICE FOR CLEANING AND DRYING METAL CHIPS

William C. Kallas, Park Ridge, Ill., assignor to Klefstad Engineering Co., Inc., Chicago, Ill.

Continuation-in-part of application Ser. No. 720,806, Apr. 12, 1968. This application Apr. 3, 1970, Ser. No. 25,384

Int. Cl. F26b *13/10*

U.S. Cl. 34—56 8 Claims



A system for cleaning and drying wet and oily metal chips within a revolving drum by vaporization and combustion. The air flow moves in an opposed direction with respect to the movement of the metal chips. A main heat means is disposed adjacent the input feed for the chips to generate heat from inside the drum to the outer walls thereof. The heat means includes means for restricting direct impingement of flame onto the oily chips. The system includes various automatic control means to control drum temperature, feed rate, air flow and afterburner temperature in a safe, efficient and economical manner.

3,619,909

DEVICE FOR THE DETACHMENT OF BUILT-UP GRANULAR MASS

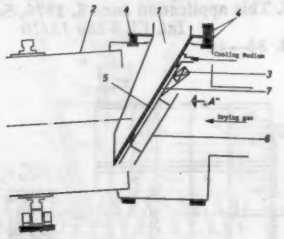
Josef Driller, Dortmund-Loh, Germany, assignor to Friedrich Uhde G.m.b.H., Dortmund, Germany

Filed Sept. 23, 1969, Ser. No. 860,229

Claims priority, application Germany, Oct. 19, 1968, P 18 04 144.6

Int. Cl. F26b *9/00*

U.S. Cl. 34—164 2 Claims



A device to exclude any build-up in a steeply inclined feed chute or prevent the growing of the material layer beyond inadmissable limits by vibrating the chute lined with adhesion-retarding material, in a longitudinal direction and protecting the chute from the hot drying gas stream by means of a heat-shielding plate and/or a cooling device.

3,619,910

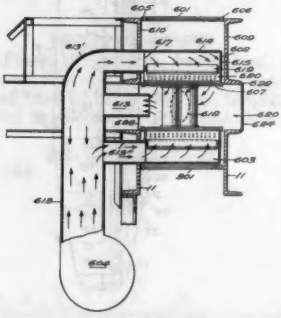
PACKAGING APPARATUS

Keith Stewart Carmichael, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Original application July 15, 1968, Ser. No. 744,848. Divided and this application Apr. 9, 1970, Ser. No. 26,927

Int. Cl. B65b *1/02*

U.S. Cl. 34—216 2 Claims



A method and apparatus for packaging articles such as cans in an overwrap of thermoplastic polymeric material is provided wherein said apparatus comprises means for grouping a pluralty of articles to be packaged, means for enwrapping said articles with said film, means for heat-sealing overlapped edge portions of said film and enclosing said articles therewithin, means for separating said film-enwrapped grouped articles, and means for shrinking said heat-sealed film to provide a package of grouped articles characterized by a substantially wrinkle-free film extending over the top, bottom, sides and portions of the ends of said grouped articles.

3,619,911

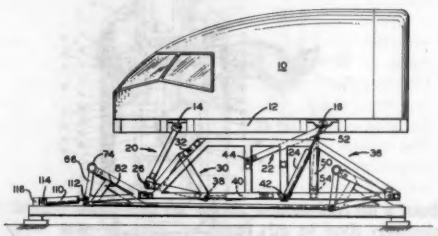
MOTION SYSTEM

Edward G. Pancoe, Chenango Forks, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.

Filed May 19, 1969, Ser. No. 825,527

Int. Cl. G09b *9/08*

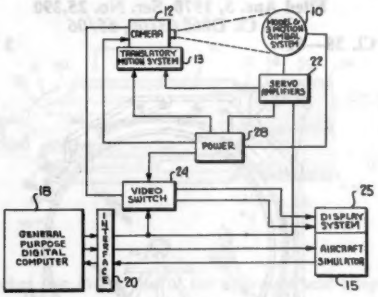
U.S. Cl. 35—12 P 4 Claims



A motion system for an aircraft simulator, or the like, of the type wherein independent actuators are provided for moving the motion platform in each single axis of freedom. The present invention provides such a system with greatly improved structural rigidity and exact duplication of motion transmitted through a linkage at a number of points. In the disclosed embodiment, vertical

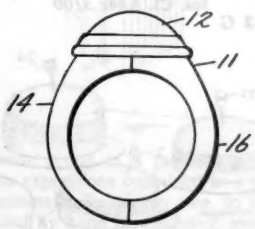
translation is imparted by rotating four bell crank members linked to four respective corners of a truss, the bell cranks being connected in a structurally closed-loop manner to eliminate backlash or lost motion in the linkage.

3,619,912
VISUAL SIMULATION DISPLAY SYSTEM
John E. Conant, Arlington, and Walter F. Buczek, Springfield, Va., assignors to Melpar, Inc., Falls Church, Va.
Filed Aug. 9, 1968, Ser. No. 751,522
Int. Cl. B64g 7/00; G09b 9/08
U.S. Cl. 35—12 5 Claims



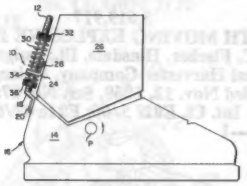
An optical image display is provided in a mosaic of contiguous individual television monitors whose rasters are suitably swept and blanked to permit translation of the desired image in any direction across the display screens or faces of the several television monitors, to simulate in a training environment a realistic view of the actual scene or visual conditions to which the trainee is to be subjected. Motion of the display image in any direction across the face of each monitor and in transition from one monitor to another in a continuous picture sequence may be accomplished by computer techniques, or by manually operated controls.

3,619,913
DEMONSTRATOR FINGER RING
Arthur B. Albrecht, Box 608, Yoakum, Tex. 77995
Filed Mar. 9, 1970, Ser. No. 17,845
Int. Cl. G09b 25/00
U.S. Cl. 35—53 9 Claims



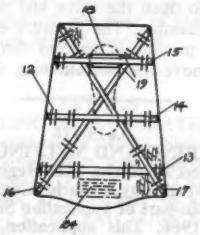
A demonstrator ring having a plurality of changeable parts comprising a male arcuate part, a female arcuate part and a top setting part. The top setting part has a plurality of joining segments projecting from its base; the male arcuate part has a plurality of joining segments projecting from it and a plurality of channel-shaped recesses therein; and the female arcuate part as a plurality of channel-shaped recesses therein. The parts are positioned so that the joining segments engage the channel-shaped recesses to form an interchangeable finger ring having a substantially circular inner surface.

3,619,914
BOOT TENSIONING DEVICE
Chris A. Hanson and Alden B. Hanson, Broomfield, Colo., assignors to The Lange Company, Dubugue, Iowa
Filed Feb. 13, 1970, Ser. No. 11,076
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 10 Claims



A tensioning device for a ski boot of the type having a foot receiving portion and a gaiter pivotally attached thereto comprising spring means which may be adjusted to vary the angle between the gaiter and the foot-receiving portion and/or the tension on the pivotal movement between the gaiter and foot-receiving portion.

3,619,915
SURVIVAL SNOWSHOES
Stanley O. Cheney, West Springfield, N.H. 03284
Filed July 16, 1970, Ser. No. 55,440
Int. Cl. A63c 13/00
U.S. Cl. 36—4.5 5 Claims

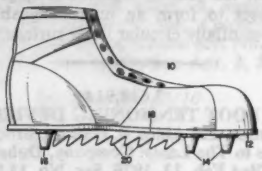


The survival snowshoes of this invention comprise a detachable portion of an exterior garment, preferably the sleeve lining, provided with slittable areas or attached tab loops. If the driver of a snow vehicle is stranded, he may detach the lining, thrust sticks through the slits, loops, or other means provided, and by lacing the stick-supported lining to his boot make an emergency snowshoe.

3,619,916
ATHLETIC SHOE
Anthony Neri, Dowd Road, Westbrook, Conn. 06498
Filed Mar. 19, 1970, Ser. No. 21,077
Int. Cl. A43b 23/28
U.S. Cl. 36—59 R 1 Claim

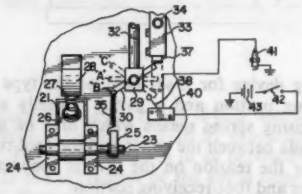
An athletic shoe for minimizing the possibility of injury to the legs or knees of the wearer comprising an upper,

a sole, tapered cleats at the toe and heel of the sole, and a safety traction block between the toe and heel cleats



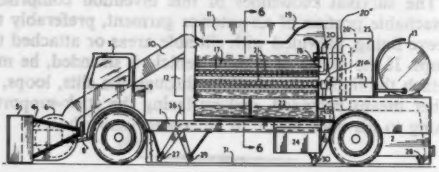
and having a plurality of ground-engaging ribs depending therefrom.

3,619,917
EARTH MOVING EXPLOSIVE DEVICE
Raymond C. Fischer, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Nov. 12, 1969, Ser. No. 875,852
Int. Cl. E02f *5/00*; E21c *47/00*
U.S. Cl. 37—1 5 Claims



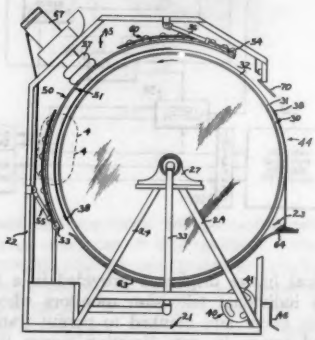
A hollow earth working implement has an opening which is closed by the earth it engages and which communicates with a combustion chamber supplied at intervals with a combustible mixture ignited by a spark plug, valve means being provided to automatically control the flow of the combustible mixture to the combustion chamber and valve control means carried by the implement being actuated by the pressure of the soil during movement of the implement to open the valve and discharge the mixture into said chamber. The pressure exerted by the expanding ignited mixture is directed through said opening to loosen and move the dirt allowing the valve to close.

3,619,918
SNOW CLEARING AND MELTING APPARATUS
Albert Z. Morin, 1411 Regina St., North Bay, Ontario, Canada
Continuation-in-part of application Ser. No. 579,282, Sept. 14, 1966. This application Mar. 5, 1969, Ser. No. 804,645
Int. Cl. E01h *5/10*
U.S. Cl. 37—12 8 Claims



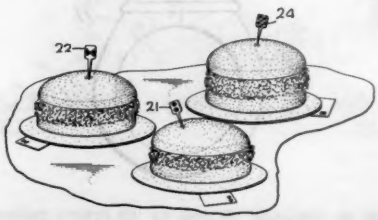
A self-propelled snow clearing apparatus embodying loading and melting mechanisms, the latter including a hopper into which the loader discharges and wherein melting is caused by a large body of hot water heated by a battery of horizontal boiler tubes immersed therein that extend longitudinally through the hopper and convey the products of combustion from a fuel fired heater in front of the hopper to an upright manifold at the rear of the hopper, from which latter a blast of hot air is conveyed to the top of the hopper and directed onto the snow being discharged into the hopper by the loader. Additional heat generated in the apparatus may be applied as hot gaseous blasts on the roadway traversed by the apparatus to the rear of the loading mechanism.

3,619,919
MACHINE FOR PRESSING SMOCK-TYPE GARMENTS
Jerry N. McMillan, P.O. Box 167, Colville, Wash. 99114
Filed Apr. 3, 1970, Ser. No. 25,390
Int. Cl. D06f *63/00, 65/06*
U.S. Cl. 38—61 3 Claims



The pressing machine is utilized for pressing smock-type garments such as doctor uniforms, nurse uniforms and the like. The machine has a rotatable horizontal drum with clips mounted at evenly spaced intervals to receive the garments. The garments are attached to the drum at the front of the machine and then the drum is stepwise rotated to convey the attached garment over the top of the drum to a pressing station. A flexible chest is mounted at the presenting station for moving against the drum to press the garment.

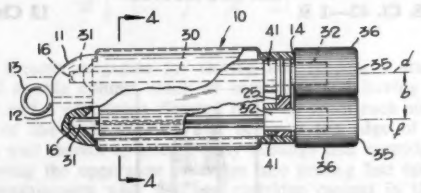
3,619,920
DISTRIBUTION OF FOOD IN AN EATERY
Lawrence Needleman, 1300 N. Larrabee, Los Angeles, Calif. 90069
Filed Aug. 22, 1968, Ser. No. 754,702
Int. Cl. A44c *3/00*
U.S. Cl. 40—2 G 2 Claims



A plurality of multi-page order books, each page in the same book bearing a waitress-identifying indicium and a like number of sets of indicium-bearing flags, each set

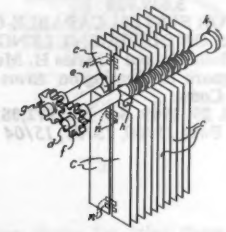
being associated with a corresponding order book, and each flag therein bearing the same indicium carried by each page in the corresponding book. A waitress records a food order on a page bearing her indicium. After the order is filled a flag with her indicium is placed on top of the ordered food which is viewable from a significant distance.

3,619,921
POCKET SIZE REFERENCE INDEX
Frank D. Marhanka, 30 Ruth Drive, St. Louis, Mo. 63031
Filed Sept. 24, 1969, Ser. No. 860,718
Int. Cl. G09f *11/24*
U.S. Cl. 40—95 **1 Claim**



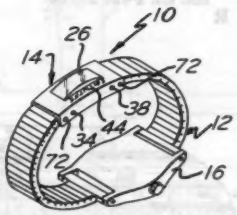
A pocket size index, useful for addresses and telephone numbers, utilizes a compact casing enclosing two spindles on which an index strip is coiled in an S-shape. The casing has a window adjacent to one of the spindles. Projecting knobs on the spindles have geared surfaces engaging each other, for rotation in opposite senses. The elasticity of the strip somewhat equalizes the other diameter of the two coils, maintaining the strip presented fairly close to the window, regardless of the extent to which the spindle adjacent to it may be unwound.

3,619,922
CHANGEABLE EXHIBITOR
Esther A. Morgan and David Morgan, both of Avenida 3, 182, Mexico City 18, Mexico
Filed July 15, 1969, Ser. No. 841,776
Int. Cl. G09f *11/26*
U.S. Cl. 40—97 **1 Claim**



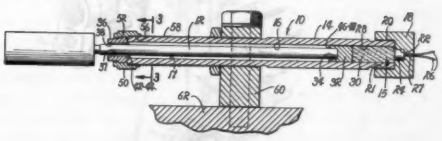
This invention refers to a multiple paging apparatus which exhibits expressions contained in a series of plates succeeding automatically one by one, to be read or observed, actioned by hand or mechanic means, characterized by a box carrying a window in its front and another window in its rear, through which are showing expressions mounted or printed on the plates supported and carried along by two screws disposed side by side in a horizontal plane and parallel to each other, and rotating in an opposite direction upon the application to the end of one of them of a circular movement which is transmitted to the other one by means of a pair of gears; characterized as well by vanes disposed at the beginning and at the ending of the screws threads, having as its purpose, those at the ending of the threads, to rotate the plates 180° on its vertical axle about the hinges joining them, being the purpose of the vanes fixed on the screws at the beginning of their threads, to accommodate them in a position to be carried along by the screws. The transport of the plates is continuous during the application of the movement causing the screws to rotate.

3,619,923
CALENDAR WATCH BAND
Mates A. Bruner, 1113 Wynnbrook Place, Secane, Pa. 19108
Filed Nov. 4, 1969, Ser. No. 873,868
Int. Cl. G09d *3/10*
U.S. Cl. 40—118 **11 Claims**



A watch band having a calendar secured thereon. The calendar comprises a housing with a transparent lens on one lateral surface thereof. A support is positioned beneath the transparent lens and a band is mounted on the support. The band has thirteen columns of numbers thereon, with any seven adjacent columns of numbers adapted to indicate all of the days of a given month. The band is movable on the support to position any seven adjacent columns of numbers beneath the transparent lens, thereby giving the user of the watch band an immediate indication of the days of a given month. Indicia are placed on the housing adjacent one edge of the transparent lens to indicate the seven days of the week.

3,619,924
SELF-OBTURATING, GAS-OPERATED LAUNCHER
T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Otto K. Heiney, Temple City, Calif.
Filed Sept. 17, 1969, Ser. No. 858,695
Int. Cl. F41c *11/00*; F41f *17/00*; F42b *11/42*
U.S. Cl. 42—1 F **1 Claim**



A self-obturating, gas-operated launcher particularly suited for use in launching projectiles in a decontaminated medium, characterized by the utilization of an elongated barrel including a rigid, barrel-sealing breech block, a muzzle block having a bore through which a projectile is ejected and a malleable slug disposed within the barrel adjacent to the breech block defining an expandable firing chamber within the barrel and adapted to be driven

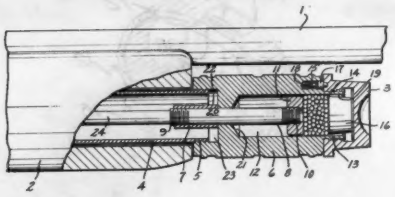
toward the muzzle block for launching a projectile as a pyrotechnic material is ignited within the chamber, a feature of the launcher being a plurality of openings formed within the muzzle block for relieving back-pressure, and an annular anvil circumscribing the bore of the muzzle block for receiving the malleable slug in impacted engagement for thus achieving an hermetic sealing of the bore thereby to retain within the barrel the residue of the ignited pyrotechnic material.

3,619,925

ADJUSTABLE SKEET WEIGHT FOR FIREARMS

James S. Martin, Wayne E. Leek, and Perry J. Pierce, Jr., Mohawk, and Thomas G. Bauman, Herkimer, N.Y., and Earl G. Larson, Fairfield, Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Nov. 4, 1969, Ser. No. 873,987
Int. Cl. F41c 27/00
U.S. Cl. 42—1 R 8 Claims



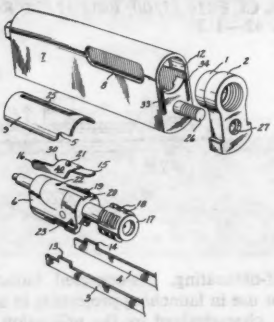
A means for changing the balance of the firearm so that a sportsman may adjust to the feel of his gun, and consequently improve the accuracy of his shot. The device adds weight below the barrel of the gun, so as to improve the accuracy of the firearm. Means are provided for quick assemblage and disassemblage of the required weights. In addition, a "piggy-back" arrangement of weighting is also contemplated in the design.

3,619,926

BOLT ACTUATED EJECTION PORT COVER

James M. Alday, Williamson, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Apr. 6, 1970, Ser. No. 25,815
Int. Cl. F41c 11/00, 27/08
U.S. Cl. 42—16 R 7 Claims



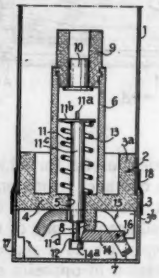
Method and apparatus for covering an ejection port in the receiver of a firearm. The cover is bolt-actuated, and telescopically moves in concert with the bolt as it is retracted from the closed breech (battery) position towards the open breech position. A point is reached in the travel of the cover, when its travel is restricted by an abutment in the interior wall of the receiver, whereupon the cover is caused to rotate with the further withdrawal of the bolt, substantially uncovering the entire ejection port area.

3,619,927

MANUALLY-CONTROLLED FIRING MEANS

Jean Robinet, Toulouse, France, assignor to Etablissement Ruggieri, Paris, France

Filed June 30, 1969, Ser. No. 837,449
Claims priority, application France, July 2, 1968, 157,528
Int. Cl. F41c 3/02
U.S. Cl. 42—1 R 12 Claims



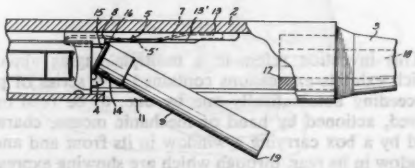
Manually-controlled firing means having a striker which is slidable in a body and capable of striking a primer under the effect of a spring. Stop means are provided on the striker and an arm pivoted to the body co-operates with the stop means for holding the striker away from the primer. A lever pivoted to the body is capable of acting on a point on the arm so as to turn the arm about its pivot and stress the spring and thus arm the striker until the arm disengages from the stop means and releases the striker.

3,619,928

FIREARM EJECTOR SYSTEM CAPABLE OF EJECTING SHELLS OF DIFFERENT LENGTHS

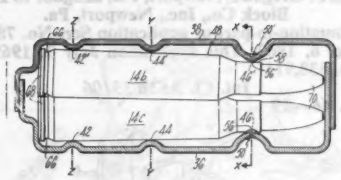
James S. Martin, Mohawk, and Charles H. Morse, Herkimer, N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Oct. 29, 1969, Ser. No. 872,081
Int. Cl. F41c 15/00, 15/02, 15/04
U.S. Cl. 42—25 R 7 Claims



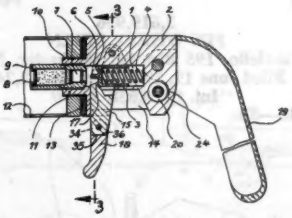
An ejection system for use in firearms comprises a plural step feature wherein shells of various lengths may be ejected. This system is adaptable to most if not all firearms having a reciprocating bolt assembly along a line in prolongation of the barrel, thus making possible fairly universal application.

3,619,929
MAGAZINE WITH ANTI-DOUBLE-FEED INDENTATIONS IN THE SIDE WALLS
Robert D. Fremont, Farmington, Conn., assignor to Colt's Inc., Hartford, Conn.
Filed Mar. 13, 1969, Ser. No. 806,806
Int. Cl. F41c *25/02, 25/04*
U.S. Cl. 42—50 3 Claims



A firearm magazine for storing and feeding a staggered double column stack of cartridges and having a body and a protrusion directed inwardly from each side wall of the body adjacent but below a top edge of a front wall thereof to intentionally misalign that cartridge following the uppermost cartridge into nesting line contact engagement with adjacent cartridge casings in the opposite column to ensure automatic alignment of the uppermost cartridge in feeding position while at the same time maintaining the following cartridge in interfering confronting relation to the front wall of the magazine body.

3,619,930
FIRING MECHANISM WITH A PIVOTED FINGER PIECE MOUNTED ON A PIVOTED TRIGGER LINK
Paul Beerman, Kreis Iserlohn, and Willi Grosse-Benne, Menden, Germany, assignors to Richard Rinker, Menden, Sauerland, Germany
Filed July 8, 1969, Ser. No. 839,909
Claims priority, application Germany, July 8, 1968, P 17 03 769.3
Int. Cl. F41c *3/02, 19/00, 23/00*
U.S. Cl. 42—69 R 7 Claims

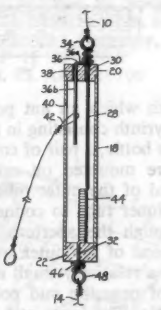


A triggering device for firing flares, illuminating and signalling ammunition, or the like includes a housing which holds a propelling charge, a firing pin mounted for axial movement to a position at which it may strike and ignite the propelling charge, spring means biasing the firing pin toward the propelling charge, a trigger link having a firing pin engaging finger thereon. The trigger link holds the firing pin in a center position against the force of the spring means and prevents its movement toward the propelling charge. The link is mounted for movement on a path in which the firing pin engaging finger pushes the firing pin back against the force of the spring means, and to a second position in which the firing pin engaging finger is moved out of the path of movement of the firing pin whereby the spring means may drive the firing pin against the propelling charge.

3,619,931
AUTOMATIC FISH HOOKING DEVICE
Carl C. Brummett, Forney, Tex., assignor to Hazel F. Brummett Shands, Brownsville, Tex.
Filed Sept. 15, 1969, Ser. No. 857,801
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 10 Claims

An automatic fish hooker comprising a portable vertically elongated standard whose pointed lower end has a turn-preventing anchoring plate. A U-bracket on the upper end serves to pivotally cradle a sleeve providing a socket-type holder for the handgrip of a fishing rod. A lateral arm on the pivoted holder serves as a setting handle. An operating connection between the handle and standard comprises a trip rod and an elastic band. Keeper means on the standard serves to position and releasably retain the trip member in a read-to-function position. A J-shaped trigger-rod has one end pivotally connected to a lower end of the sleeve and its free end shiftably supported on a keeper carried by and projecting laterally from the standard.

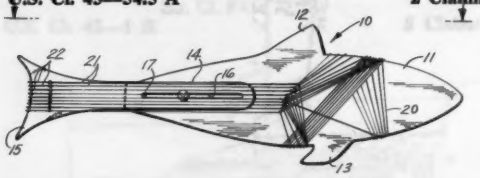
3,619,932
WEIGHT RELEASE MECHANISM
James D. Maxwell, 11001 SE. 19th St., Vancouver, Wash. 98664
Filed Mar. 17, 1970, Ser. No. 20,226
Int. Cl. A01k *91/04*
U.S. Cl. 43—43.12 6 Claims



A weight release mechanism includes a tubular body portion and end enclosures through which a wire-like shank slidably extends. The shank has opposite ends projecting from the body portion one of such ends being arranged to be connected to a pole line and the other end to a fish line. The shank has an offset parallel finger

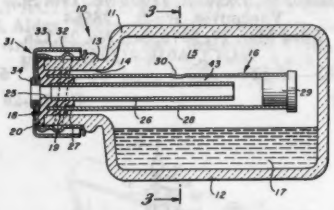
which extends interiorly of the body portion and operates in the area of a window provided in the body portion. Such finger is arranged to engage the end loop of a weight line. The shank is formed of a spring wire or the like and has spring convolutions formed directly therein which provide elongation of the shank to the extent that the weight release finger is movable out of the plane of the window to release the weight, such action occurring when a large fish is hooked and also when the weight becomes snagged.

3,619,933
TROT LINE KEEPER
Irvin Wayne Couch, 2200 Mission Hill Circle, Apt. 101, Austin, Tex. 78741
Filed Feb. 11, 1969, Ser. No. 798,384
Int. Cl. A01k *97/00*
U.S. Cl. 43—54.5 A **2 Claims**



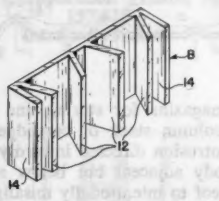
An elongated, flat trot line keeper in the shape of a fish for a trot line having a plurality of fish hooks thereon. The keeper comprises a pair of body members slidable relative to each other with means to clamp the members together at any selected position. The trot line is wrapped about the body of the keeper and the fish hooks are received by a transverse end edge of the keeper.

3,619,934
SAFETY ANT-POISON BOTTLE
Wilfred Tunstall, 12874 2nd St., Yucaipa, Calif. 92399, and Albert Wegner, 223 Sylmer Court, Calimesa, Calif. 92320
Filed Oct. 21, 1969, Ser. No. 868,104
Int. Cl. B65d *55/02*; G01m *1/20*
U.S. Cl. 43—131 **2 Claims**



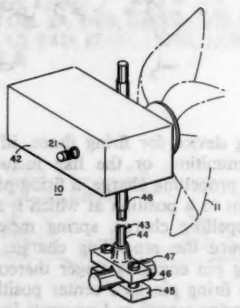
A labyrinth with which an ant poison bottle may be equipped, said labyrinth consisting in an apertured closure for the neck of the bottle, a pair of concentric tubes, outer ends of which are mounted on said closure so as to close the outer end of the outer tube while allowing the outer end of the inner tube to connect with the exterior of the bottle through the aperture in said bottle neck closure the inner end of the outer tube being closed, the outer tube having a relatively small insect access opening in the wall thereof near the mid point of the space enclosed by the bottle. The inner end of the inner tube is open and extends inwardly well beyond said insect access opening, the space between said tubes defining a reservoir with a capacity substantially in excess of the first tube thereby containing a greater quantity of the liquid poison than a child could practically manage to introduce through said insect access opening into said outer tube by manipulation of the bottle, said labyrinth thereby practically preventing admission of such poison into the inner end of the inner tube which alone could cause poison to flow through said inner tube to the outer end thereof and thus be made available to the child.

3,619,935
TOY BLOCKS
Resta S. Gregoire, Newport, Pa., assignor to Z-Loc Block Co., Inc., Newport, Pa.
Continuation-in-part of application Ser. No. 784,282, Dec. 6, 1967. This application July 3, 1969, Ser. No. 838,911
Int. Cl. A63h *33/06*
U.S. Cl. 46—19 **3 Claims**



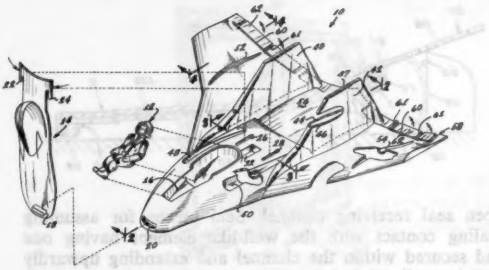
The set of eight basic forms of toy blocks includes an assortment of half height blocks of the wall layer forms, the aggregate total quantity of blocks in the set being sufficient to build a complete doll house or other building structure, with framed door and window openings in the walls and a roof, as may be desired. The blocks are laid in two interlocked layers to form the walls, by laying the rows or courses alternately in the opposite layers in vertically overlapping relation between the opposite rows, and the blocks in one layer horizontally overlapping the blocks in the other layer, and thus each block in one layer interlocks the corners of four adjacent blocks in the other layer, which it overlaps. The blocks are light and have a running fit betwen the blocks in the opposite layers into their sliding interlocks as they are laid, enabling any child to design the wall structure as he builds or removes some of the blocks, and changes the designs with the greatest of ease in accordance with his fancy, meanwhile learning while actually constructing.

3,619,936
PIN WHEEL SIREN
Fred S. Tauriello, 195 Birr St., Rochester, N.Y. 14613
Filed June 19, 1970, Ser. No. 47,749
Int. Cl. A63h *33/40*
U.S. Cl. 46—53 **10 Claims**



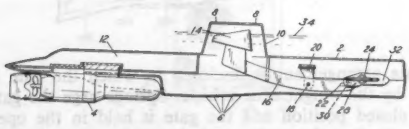
A pin wheel siren is disclosed wherein a diaphragm is driven in a flexural mode by a cantilever arm member fixed to the diaphragm at one end and displaced at the other free end in response to a rotating member having peripheral high and low regions. A wind wheel or a pin wheel rotates the rotating member to produce a siren sound as the diaphragm is vibrated in the flexural mode.

3,619,937
SPACE GLIDER
Norman C. Thompson, Bonita, and Dennis H. Merino, Harbor City, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 10, 1969, Ser. No. 883,756
Int. Cl. A63h 27/00
U.S. Cl. 46—76 6 Claims



A toy airplane with a capsule at the front for holding a medium size toy figure of a type which a child may play with independently of the airplane. The airplane is vacuum formed from a sheet of plastic, with a recess near the front for holding the figure in a backwardly reclining position to more easily accommodate the figure. The figure-holding recess formed on the top of the airplane creates a protuberance on the underside, which serves as a hand hold for use in launching the airplane. The airplane walls are of single thickness, except for a pair of vertical stabilizers that have double walls to facilitate their formation during the vacuum forming process.

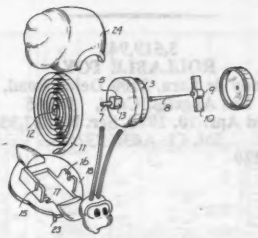
3,619,938
SUBMERGED MODELS
Duncan Tong, Hong Kong, assignor to General Electric Company
Continuation-in-part of application Ser. No. 777,435, Nov. 20, 1968. This application Dec. 4, 1970, Ser. No. 95,141
Int. Cl. A63h 23/04
U.S. Cl. 46—94 8 Claims



A power driven submarine model toy for sailing wholly or partly submerged in water having a control device comprising a float pivotally connected to the body of the model to an elevator fin, the angular position of which determines the angle of inclination of the model to the water through which it is being driven.

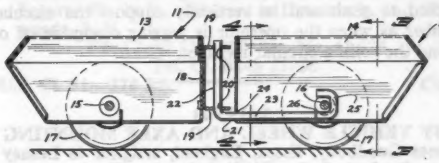
3,619,939
DRIVING DEVICES FOR TOYS
Jorge Argemi Vidal, Calle Maignon 10, Barcelona, Spain
Filed Feb. 19, 1969, Ser. No. 800,460
Claims priority, application Spain, Feb. 20, 1968, 315,150
Int. Cl. A63h 11/10
U.S. Cl. 46—201 3 Claims

A driving device for a toy is formed by a rotary member to which there is attached one end of a spring which is anchored at its other end, and also one element of a braking device formed by a casing which contains a



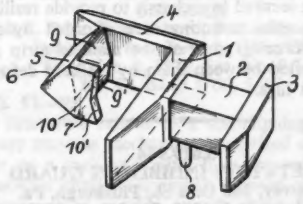
viscous substance and at least one vane which tends to move inside the viscous substance under the working force of the spring.

3,619,940
ARTICULATED TOY VEHICLE
Thomas W. Good, Golden Valley, and Theodore H. Zbikowski, Plymouth, Minn., assignors to Tonka Corporation, Mound, Minn.
Filed Nov. 25, 1969, Ser. No. 879,713
Int. Cl. A63h 11/10
U.S. Cl. 46—201 3 Claims



An articulated toy vehicle comprising two wheeled vehicle units interconnected in tandem draft relation with the connection effected by a hitch link having one end pivoted on a vertical axis to a laterally central point on one vehicle and extending longitudinally of the body of the other vehicle and loosely around the wheel axle thereof to allow limited tilting of said axle and other vehicle about a longitudinal axis.

3,619,941
COUPLING FOR TOY AND MODEL RAILROADS
Max Ernst, 14 Lohengrinstrasse, 85 Nuremberg, Germany
Filed July 22, 1969, Ser. No. 843,654
Claims priority, application Germany, July 23, 1968, P 17 03 876.5
Int. Cl. A63h 19/00
U.S. Cl. 46—216 2 Claims



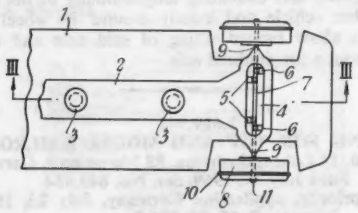
A coupling member consisting of a single integral piece with two arms arranged substantially rectangularly with regard to each other, in which one arm has a first member with protruding surface means and has a second member with protruding surface means for nesting in a surface

corresponding to said first surface and pertaining to a second coupling member to be coupled to the first mentioned coupling member.

3,619,942
ROLLABLE TOY
Rudy de Lara, 2700 Delor Road, Los Angeles, Calif. 90065
Filed Apr. 10, 1970, Ser. No. 27,350
Int. Cl. A63h *33/02*
U.S. Cl. 46—220 2 Claims

A rollable toy comprising a circular member for rolling on the ground and means for rolling and guiding the circular member along the ground comprising a handle for reaching from the hand of an operator to adjacent the ground and a controller extending from the handle and adapted to push and to vertically support the circular member as when the operator is jogging alongside of or behind the rolling circular member.

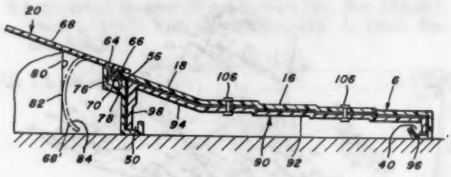
3,619,943
TOY VEHICLE WHEEL AND AXLE MOUNTING
James Goodbody, Essex, England, assignor to Lesney Products & Co., Limited, London, England
Filed Dec. 8, 1969, Ser. No. 882,823
Claims priority, application Great Britain, Dec. 10, 1968, 58,729/68
Int. Cl. A63h *17/26*
U.S. Cl. 46—221 10 Claims



A toy vehicle having thin wire axles with ground wheels rotatably mounted at their opposite ends. The axles are mounted on end regions of a resilient strip which has a central region secured to a chassis to provide resilient suspension. The axle mountings are afforded by resilient barbed lugs forming parts of the resilient strip and the axles are inserted between them by resilient deformation of the barbed lugs.

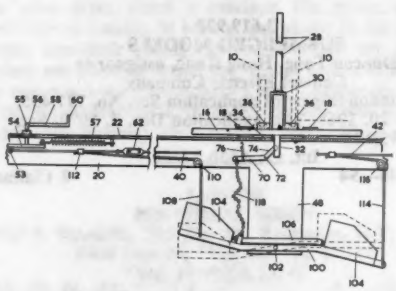
3,619,944
VEGETATION INHIBITING GUARD
Joseph J. Matvey, 208 Orin St., Pittsburgh, Pa. 15235
Filed July 2, 1970, Ser. No. 51,973
Int. Cl. A01g *1/08*
U.S. Cl. 47—33 10 Claims

A vegetation inhibiting member for protective placement adjacent exterior wall-like surfaces. At least one guard element having a substantially horizontal outer portion and an adjacent upwardly and inwardly directed inner portion. The guard may consist of a closed multisided frame. A plurality of guard elements defining a closed protective frame may be provided. Each guard element having an outer portion provided with a downwardly depending ground engaging leg and an inner portion having a downwardly depending inner ground engaging leg. The inner portion having a generally upwardly



open seal receiving channel. Seal means for assuming sealing contact with the wall-like element having one end secured within the channel and extending upwardly and inwardly therefrom. Hidden splice means for joining abutting edges of guard elements and corner elements which serve to define the closed frame. Concealed anchor means for penetration into the underlying earth may be provided.

3,619,945
GATE ARRANGEMENT
Gilliam Loots, 7 Windsor Drive, Durban N., Durban, Natal, Republic of South Africa
Filed Dec. 14, 1970, Ser. No. 97,503
Int. Cl. E05f *15/20*
U.S. Cl. 49—30 11 Claims

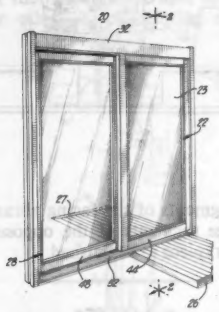


A gate arrangement is disclosed in which the gate is opened by the weight of a vehicle. Springs urge the gate to the closed position and the gate is held in the open position against the actions of the springs by a catch. Timing means for releasing the catch consists of a tilt arm on each end of which is located a tank for a liquid. The weight of the vehicle causes the arm to tilt to raise one tank above the other, causing the liquid to flow from the one to the other. After a time governed by the rate of flow of the liquid, the weight of the liquid in the other tank is sufficient to actuate the catch.

3,619,946
AUTOMATIC DOOR OPERATOR
Thomas H. Crocker, Niles, Mich., assignor to American Metal Climax, Inc., New York, N.Y.
Filed Nov. 27, 1970, Ser. No. 93,093
Int. Cl. E05f *13/04*
U.S. Cl. 49—264 10 Claims

An automatic door operator for a door mounted upon a door frame for sliding movement in a vertical plane between open and closed positions includes a drive cylinder

to open and close the door by means of a drive piston slidably movable within the drive cylinder between air inlets located at each end of the cylinder. In reponsse to the movement or absence of traffic adjacent the door, a control valve supplies compressed air to one of the air inlets and exhaust the other air inlet so that the drive



piston is moved toward the other air inlet, and the door is advanced toward its open or closed position. As the door nears either of its positions, a cushion assist switch is maintained in an operative condition for a short period of time, during which time the control valve reverses the air flow in the drive cylinder to assist in bringing the door to a gentle stop at its open or closed position.

3,619,947

CORNER FASTENER AND ROLLER ASSEMBLY FOR SLIDING DOOR FRAMES

Harold J. Burum, San Leandro, Calif., assignor to Kenneth P. Byrd, West Sacramento, and Joseph G. White, North Highlands, Calif., fractional part interest to each

Filed Feb. 12, 1970, Ser. No. 10,895
Int. Cl. E05d *13/02*
U.S. Cl. 49—425 **2 Claims**

A one-piece corner fastener for securing the stile and rail together of a sliding door frame, the corner fastener being made of plastic and having an integral roller-carrying arm with sufficient resiliency to yieldingly hold the roller in engagement with a door frame guiding track. Adjustable stop means limits the extent of movement of the roller away from the door frame guiding track.

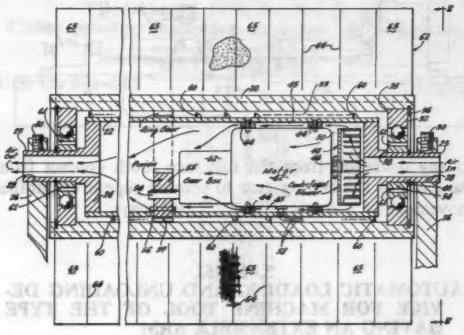
3,619,948

INTERNALLY POWERED ROTARY ABRASIVE MEANS

Russell W. Burns, Pacific Palisades, Calif., assignor to Merit Abrasive Products, Inc.

Filed Apr. 21, 1969, Ser. No. 817,773
Int. Cl. B24b *7/00, 55/02*
U.S. Cl. 51—72 **10 Claims**

A hollow mandrel powered by an internal motor carries radial abrasive leaves, the mandrel having peripheral recesses and ribs for air cooling effect, the recesses providing overhanging shoulders, the abrasive leaves being



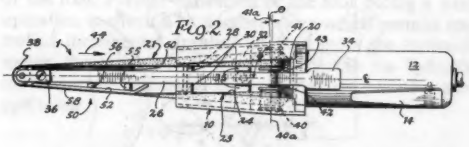
attached to suitable retainer members and the retainer members releasably engaging the overhanging shoulders.

3,619,949

MINIATURE BELT GRINDER

Walter N. Welsch, Tonawanda, and Louis J. Buchman, Eggertsville, N.Y., assignors to Dynabrade, Inc., Tonawanda, N.Y.

Filed June 12, 1970, Ser. No. 45,629
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 EB **7 Claims**



A hand tool grinder having an endless belt entrained about a non-parallel drive and idler pulleys such that the flights thereof pass over a pair of crown-surfaced direction change pulleys having their respective axes arranged non-parallel to each other and to the drive and idler pulleys. A guide device is provided to constrain the belt adjacent the idler pulley for flat surface grinding operations and a mounting arrangement is provided to permit interchangeable mounting of idler pulleys of both differing diameters and lengths.

3,619,950

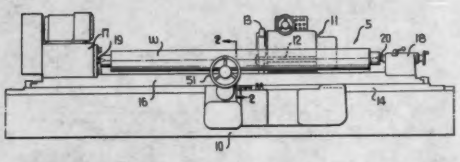
SELF-ALIGNING RACK FOR TRAVERSING MEMBER

Ralph E. Price, Waynesboro, Pa., assignor to Litton Industries, Inc., Beverly Hills, Calif.

Filed Feb. 9, 1970, Ser. No. 9,742
Int. Cl. B24b *3/00, 5/00*
U.S. Cl. 51—95 **9 Claims**

This disclosure relates to a self-aligning rack. In the customary traverse mechanism comprised of a traversing member or a rack and gear, it is impossible to obtain and maintain perfect alignment between engaging teeth. It is proposed to provide a rack which is self-aligning to absorb the strain of the driving forces without interfering with the desired true tracking of a slidable member or carriage of a machine tool. A crowned surface of the rack is secured against an adapter by a plurality of screws compressing a like number of coil springs to

provide a resilient mounting for the rack and thus allowing the rack to tilt on the crowned surface in response



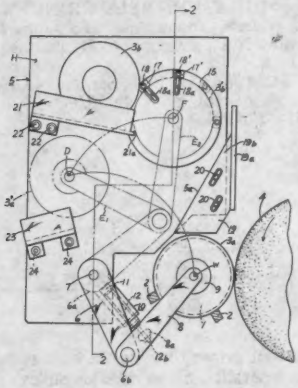
to any deviation from the full face tooth contact from the teeth of the driving gear to provide repetitive parallel movement of a carriage in machined ways.

3,619,951

AUTOMATIC LOADING AND UNLOADING DEVICE FOR MACHINE TOOL OF THE TYPE HAVING AN EXTENSIBLE ARM

Makoto Kikuchi and Toyoaki Saeki, Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Apr. 24, 1970, Ser. No. 31,618
Claims priority, application Japan, Apr. 30, 1969, 44/33,483
Int. Cl. B24b *5/32*
U.S. Cl. 51—103 WH **19 Claims**



In a single-arm type automatic loading and unloading device, wherein an unoperated workpiece is carried into an operating position from a loading chute by a loading arm and an operated workpiece is moved out of the operating position to a discharge chute, the improvement wherein the device adopts an extensible arm to swing, as being shortened or extended, from a pickup position to the operating position and from the operating position to an unloading position so that unproductive time is reduced to a minimum.

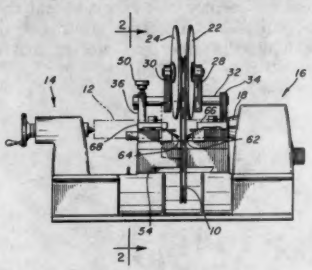
3,619,952

MACHINE FOR SURFACING BRAKE DISCS

Paul W. Leming and Richard J. Flanigan, Longmeadow, Mass., assignors to Universal American Corporation, Springfield, Mass.

Filed July 10, 1969, Ser. No. 840,614
Int. Cl. B24b *5/04*
U.S. Cl. 51—117 **8 Claims**

A machine for surfacing brake discs has a transversely movable carriage upon which a pair of adjustable cutters are provided for rough surfacing of the disc, and upon which a pair of resilient sanding discs are provided for finishing the brake disc surfaces. The resilient abrasive discs are mounted on a pair of pivotal arms respectievly, which arms can be adjusted on a rockshaft so as to vary the spacing between the abrasive discs, and can also be moved pivotally on said rockshaft from and to active posi-



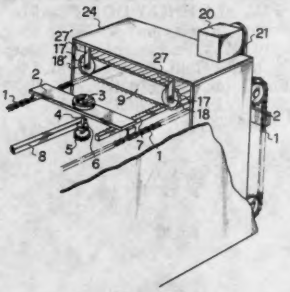
tions wherein segments of the facing abrasive surfaces of said discs engage segments of the opposed faces of the brake disc or workpiece to be finished.

3,619,953

APPARATUS FOR ROUNDING END OF FLEXIBLE PLASTIC WIRE

Minoru Hosoya, Tokyo, and Masaaki Hayashi, Funabashi-shi, Japan, assignors to KAO Soap Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1970, Ser. No. 1,094
Claims priority, application Japan, Jan. 10, 1969, 44/1,977
Int. Cl. B24b *5/00, 21/02, 29/00*
U.S. Cl. 51—145 **5 Claims**



An apparatus for rounding ends of flexible wire elements or brush hair elements, including a continuously traveling transfer chain and a wire holder means attached to the transfer means for movement therewith. The wire holder means is mounted for rotation about an axis perpendicular to the advancing direction of the transfer chain. An endless grinding means having a wave-like grinding surface thereon is disposed above the transfer chain and is moved in a direction transverse to the advancing direction of the transfer chain, whereby the tip ends of the wire elements contact the grinding surface and are continuously ground and polished.

3,619,954

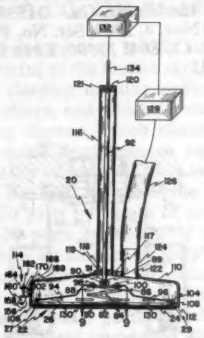
SURFACE-TREATING APPARATUS AND METHOD

Billy G. Miller, 1430 Lincoln, Salt Lake City, Utah 84105

Filed Feb. 7, 1969, Ser. No. 797,481
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 T **11 Claims**

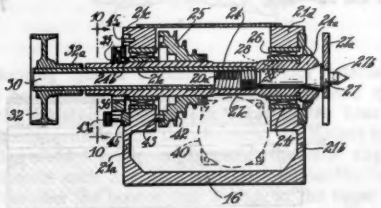
A surface-treating apparatus and method, the apparatus including centrally-joined radially-extending blades comprising a fan-shaped plate, a resilient compressible

coil spring, interposed between the back of the plate and a rotatable drive shaft non-rotatably joined to the plate through the spring, and a housing generally surrounding all except the front face of the radially-extending blades, the housing terminating in a hollow handle which rotatably carries the shaft. A stabilizer rod bridges between the free end of each blade and the spring. The shaft is powered by a suitable motor, and clamping structure associated with the blade is provided to maintain sheets of abrasive or other surface-treating material in taut



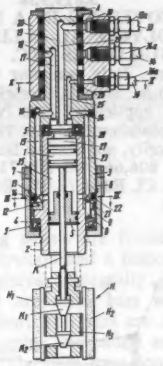
relation across the front face of each blade. A dust egress aperture is preferably provided in the housing to accommodate connection of a vacuum to continuously remove particles treated by action of the abrasive material on a surface. Preferably air ingress ports exist in the periphery of the housing adjacent the free ends of the blades. Procedurally, the blades yield fore and aft as necessary to follow variations in the surface being treated, with the stabilizer rods exerting a restraining force counter to the instantaneous fore and aft motion of the blades.

3,619,955
GRINDING ATTACHMENTS FOR SURFACE GRINDERS
Eric Fischback, Hammond, Ind.
(928 E. Broadway, Bradley, Ill. 60915)
Filed June 12, 1970, Ser. No. 45,769
Int. Cl. B24b *5/04*
U.S. Cl. 51—237 **7 Claims**



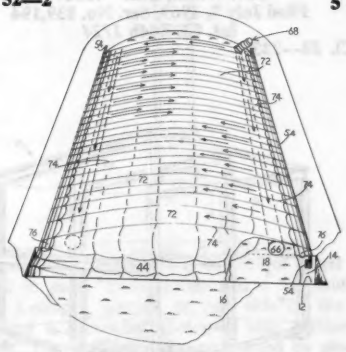
A rotatable work attachment for a surface grinder. This type of attachment has a draw-spindle journaled in bearings and carrying a center pin. The present draw-spindle is threaded where it passes through an inner bearing journal to receive a split nut; and the latter is encircled by a ring with a cluster of screws directed to the periphery of the nut to tighten the same on the draw-spindle after the nut has been advanced to the journal. The attachment also has easily changeable bolt connections at the bottom, a self-alining driving pulley, and a more durable base connection in a tail stock.

3,619,956
HYDRAULIC FEEDING DEVICE FOR A HONING TOOL
Christoph W. Gehring, 29 Gehringstrasse, 7302 Nellingen, Germany
Filed Apr. 14, 1970, Ser. No. 28,386
Claims priority, application Germany, Apr. 17, 1969, P 19 19 403.7
Int. Cl. B24b *9/02*
U.S. Cl. 51—349 **7 Claims**



The specification discloses a device for honing in which a honing tool is rotated and, while rotating, is expanded into engagement with the work. A hydraulic motor effects expansion of the honing tool and when the honing tool engages the work and is retarded in rotation thereby, a rotary valve is closed to interrupt the draining of fluid from the hydraulic motor and thereby halt the expansion of the tool. Further expansion of the tool during a work operation is effected by another valve which permits controlled incremental draining of fluid from the hydraulic motor. Reversing of the supply of fluid to the hydraulic motor permits collapsing of the tool at the end of a work operation.

3,619,957
INFLATABLE CANOPY FOR OUTDOOR AREAS
Herbert Alexander Adam, 9800 Lougheed Highway, Burnaby 3, British Columbia, Canada
Continuation of application Ser. No. 706,047, Feb. 16, 1968. This application Dec. 11, 1969, Ser. No. 888,211
Int. Cl. E04b *1/34*
U.S. Cl. 52—2 **5 Claims**



A canopy is constructed of inflatable tubular side walls which rest on the field; the tubular side walls are connected to transverse tubular blisters which are inflated

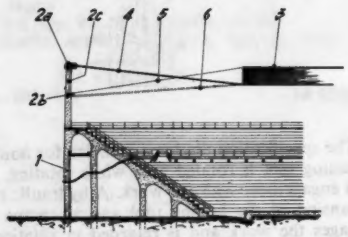
through the tubular side walls. The canopy is carried along a pair if tracks and is container in a trench which is parallel to the track; rollers are provided in the trench which squeeze the canopy so that it can be stored below the rollers, the rollers also providing a seal at that end of the canopy for the air in the tubular side walls which are positioned in the track.

3,619,958

OVERHEAD COVERING IN A DUAL CABLE SYSTEM FOR POLYGONAL, ELLIPTICAL OR CIRCULAR PLAN BUILDINGS ETC.

Aldo Viesi, Rome, Italy, assignor to Grandi Padiglioni, S.p.A., Isorelle (Brescia), Italy

Continuation of application Ser. No. 738,196, June 19, 1968. This application Mar. 24, 1970, Ser. No. 20,460
Claims priority, application Italy, Jan. 3, 1968, 806,664/68, 806,715/68
Int. Cl. E04d *13/00;* E04h *3/12*
U.S. Cl. 52—83 9 Claims



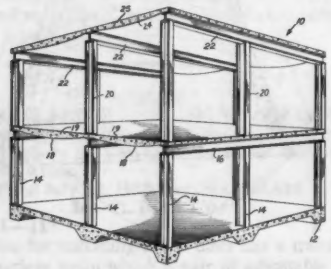
An annular overhead covering including an outside semi-rigid ring, an inside semi-rigid ring of a diameter smaller than the outside ring, a first plurality of supporting cables connecting the lower portion of the inside ring with the upper portion of the outside ring, a second plurality of tensioning cables connecting the upper portion of the inside ring with the lower portion of the outside ring, means for supporting the outside ring, and means carried by the cables for covering the space between the rings.

3,619,959

CONCRETE BUILDING

Sidney A. Parker, 5820 Diamond Oaks Drive S., Fort Worth, Tex. 76117

Filed July 7, 1969, Ser. No. 839,194
Int. Cl. E04b *1/24*
U.S. Cl. 52—223 1 Claim



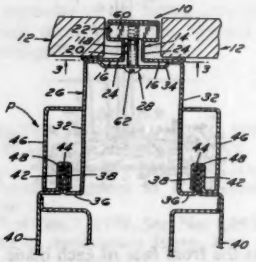
An improved elongated concrete member and a method for fabricating improved elongated prestressed or nonprestressed concrete members in situ and without form work comprising stretching a support comprising a sheet or a plurality of bands between spaced end supports, applying wet concrete onto said support, and curing the concrete to form a prestressed or nonprestressed concrete member having a flat top surface and a generally parabolic bottom surface between the end supports.

3,619,960

COMBINATION CEILING GRID AND PARTITION RECEIVER

Walter W. Thompson, P.O. Box 627, Hazlehurst, Ga. 31539

Filed Nov. 4, 1969, Ser. No. 873,880
Int. Cl. E04f *13/00;* E04b *5/52*
U.S. Cl. 52—241 3 Claims



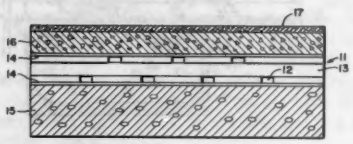
A ceiling grid which is also useable as a partition receiver. The ceiling grid has laterally outwardly extending flange portions adapted to marginally support ceiling panels. It also has an elongated T-shaped slot open at the bottom for receiving fastening means adapted to mount a partition header.

3,619,961

VENTING ROOF INSULATION PRODUCT

Robert W. Sterrett, Wayland, Mass., Francis J. Jacob, New Castle, Pa., and Merle D. Chamberlain, deceased, late of Pittsburgh, Pa., by Lois M. Chamberlain, executrix, Pittsburgh, Pa., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of application Ser. No. 610,524, Jan. 20, 1967. This application Mar. 24, 1970, Ser. No. 22,206
Int. Cl. E04b *1/70;* E04d *1/20*
U.S. Cl. 52—302 7 Claims



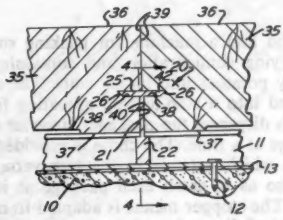
A roof deck material for use in an insulated, ventilated built-up roofing system having a relatively rigid body of foamed plastic resin (e.g. foamed polystyrene) which has oppositely facing grooved surfaces to provide venting of entrapped moisture within the system, especially from moisture-bearing construction material (e.g. vermiculite concrete) poured upon the deck material during installation of the system. The grooves are sufficiently narrow to prevent the uncured construction material from filling the grooves. Preferably, the grooves are covered with a layer

of moisture permeable material (e.g. kraft paper) to insure the prevention of filling of the grooves by the construction material.

3,619,962
METAL CLEANER
Gordon C. Combe, 16 Lyndhurst Place, London, Ontario, Canada
No Drawing. Continuation-in-part of application Ser. No. 582,538, Sept. 28, 1966. This application Sept. 25, 1969, Ser. No. 861,173
Int. Cl. C11c *3/00*; B24d *3/02*
U.S. Cl. 51—304 7 Claims

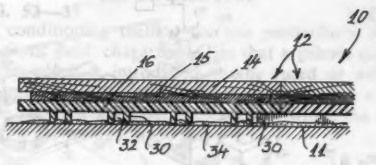
A liquid abrasive cleaner which is essentially non-acidic, is not harmful to the human skin, which is particularly useful for cleaning metallic surfaces, in particular stainless steel surfaces, and which leaves a non-corrosive protective coating thereon, which cleaner is in the form of a relatively stable homogeneous aqueous dispersion consisting essentially of, per 500 parts by weight of water and based upon the total weight of the composition, (a) from about 10–30 parts by weight of soap fatty acid (b) from about 10–30 parts by weight of dicarboxylic acid (c) a weak base in an amount at least sufficient to neutralize said acids and form salts therewith (d) from about 90–50 parts by weight of calcined diatomaceous silica of predominately colloidal particle size (e) from about 90–50 parts by weight of uncalcined diatomaceous silica of predominately colloidal particle size and (f) from about 20–40 parts by weight of a gelling agent, said gelling agent being present in an amount sufficient to maintain the calcined and uncalcined diatomaceous silica particles in homogeneous dispersion.

3,619,963
FLOORING SYSTEM
Ray E. Omholt, Berwyn, Pa., assignor to Powerlock Floors, Inc., Philadelphia, Pa.
Filed July 31, 1969, Ser. No. 846,323
Int. Cl. E04b *5/00*; E04f *15/02*
U.S. Cl. 52—483 2 Claims



A flooring system utilizing wood floor boards, the boards being supported on transversely disposed spaced channels, metallic holding clips securing the boards in bearing engagement with the channels, the boards having side edge slots for clip engagement, the clips engaging the channels each having a web portion vertically disposed between the boards and having, at the upper margin of the body portion a horizontally extending plate portion with opposing parts on each side extending into one or more edge grooves, the horizontally extending plate portion being highly resistant to bending and distortion under stress with respect to the web. The opposing parts of the horizontal plate are in fiber penetrating relation on opposite sides, so that the bending forces in the plate portion substantially or totally balance each other to limit bending distortion which would otherwise occur in the web if the forces were not so balanced, the strength being determined by the wood in shear without appreciable reduction in holding power caused by deformation of the clip itself.

3,619,964
FLOORING PANELS
Frank Passaro, 23—54 E. 5th St. 11218; Ned Ross, 259 E. 52nd St. 11203; and Leo Mondry, 501 New York Ave. 11225, all of Brooklyn, N.Y.
Filed Dec. 10, 1969, Ser. No. 883,828
Int. Cl. E04f *13/08*
U.S. Cl. 52—309 8 Claims

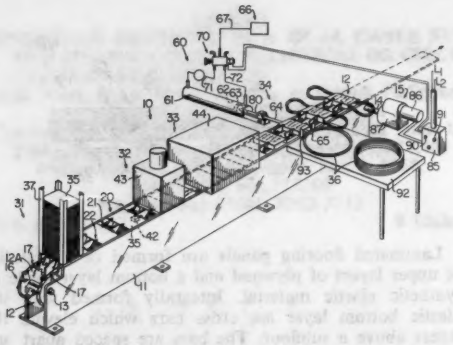


Laminated flooring panels are formed of a plurality of upper layers of plywood and a bottom layer made of synthetic plastic material. Integrally formed with the plastic bottom layer are cross bars which elevate the layers above a subfloor. The bars are spaced apart and underlap adjacent panels. The panels are secured to the subfloor by cement. The bars have longitudinal grooves into which the cement enters for improving the attachment to the subfloor. Air spaces under the panels improve sound absorption thermal insulation, and moisture resistance of the panels.

3,619,965
WALL PANEL
Joseph Andrew Thibert, 85 Chelwood Road, Scarborough, Ontario, Canada
Filed Dec. 29, 1969, Ser. No. 888,287
Claims priority, application Canada, Jan. 3, 1969, 39,179
Int. Cl. E04c *2/38*
U.S. Cl. 52—580 3 Claims

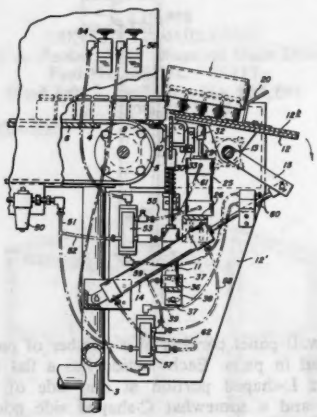
The wall panel consists of a number of panel sections connected in pairs. Each section has a flat central portion, an L-shaped portion at one side of the central portion and a somewhat C-shaped side portion at the other side. The wall panel is constructed by placing the sections in pairs so that their side portions contact one another and disposing one pair beside another. The sections may be disposed either vertically or horizontally. Provision is made for nesting one pair to an adjacent pair in order to maintan the wall panel in an assembled state.

3,619,966
APPARATUS FOR AND METHOD OF PACKAGING ENDLESS BELTS
Eugene J. Goldsberry, Cincinnati, Ohio, assignor to Dayco Corporation, Dayton, Ohio
Filed May 5, 1970, Ser. No. 34,676
Int. Cl. B65b *5/04, 25/24*
U.S. Cl. 53—3 **19 Claims**



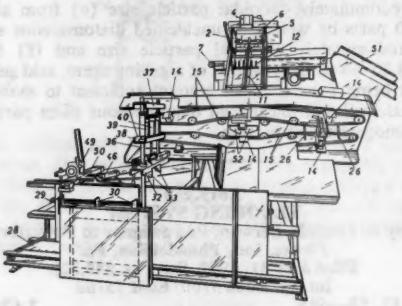
A tubular sleeve is held open at a packaging station and an endless belt is packaged therein by providing an actuator having a rod which is supported for reciprocating movements in a substantially rectilinear path and the rod has hook means at its terminal end which is adapted to engage the endless belt. The actuator operates to extend its rod through the open sleeve enabling hooking the belt on the hook means and then retracts the rod to pull the belt the required distance through the sleeve.

3,619,967
METHOD AND APPARATUS FOR NESTING BOTTLES AND OTHER CONTAINERS
Frank P. Alduk, 116 Guadalcanal Road, New Castle, Pa. 16101
Filed May 14, 1969, Ser. No. 824,639
Int. Cl. B65b *5/06, 21/22, 35/44*
U.S. Cl. 53—26 **18 Claims**



There is disclosed a machine and method for packing containers in a carton using an inverted carton type of case packing machine in what is known as a nested arrangement, in which the articles in one row are offset with respect to the articles in the adjacent rows a distance of approximately one-half the diameter of the container. The containers are conveyed between side guides, which preferably oscillate, over an unobstructed open arranging area onto a tiltable platform. By assuring the staggering of the containers in the first two rows crosswise on this platform, all containers thereafter indefinitely repeat the pattern of the first two rows if they are forced or crowded toward the platform. Also provision is made for initially tilting the platform a short distance to facilitate application of the inverted carton over the containers on the platform before the platform is tilted upright to upset the carton.

3,619,968
METHOD AND APPARATUS FOR PACKING SMALL PACKAGES HAVING VARYING CONFIGURATION AND CONTAINING ROOT-CROPS INTO LARGER RECEPTACLES
Erik Gunnar Kapare, Goteborg, Sweden, assignor to Billeruds Aktiebolag, Saffle, Sweden
Filed Nov. 17, 1969, Ser. No. 877,234
Claims priority, application Sweden, Nov. 25, 1968, 16,001/68; Nov. 11, 1969, 15,426/69
Int. Cl. B65b *35/50, 5/06*
U.S. Cl. 53—26 **17 Claims**

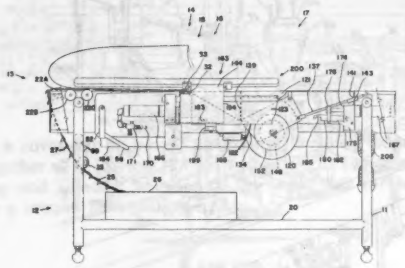


A method and a machine for packing small packages having varying configuration and containing root-crops, particularly potatoes into larger units. The smaller packages are fed into a step-by-step operating feeder mechanism which dispenses the packages stepwise onto a chute, one package at a time. The chute is provided with a stopper means which extends in the transverse direction of the chute so as to catch each package as it slides down the chute. The stopper means is adapted to move stepwise at the speed of dispensing of the feeder mechanism downwards along the chute and when a predetermined number of packages have aggregated the stopper means releases the unit of packages thus aggregated whereby they will fall into a sack beneath the chute as a close unit. In addition, retaining means are arranged to hold the sack in open position at the lower end of the chute and closing means for closing the sack.

3,619,969
METHOD AND APPARATUS FOR PACKAGING
Edward L. Holcombe, Taylors, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Nov. 24, 1969, Ser. No. 879,449
Int. Cl. B65b *43/36*
U.S. Cl. 53—29 **10 Claims**

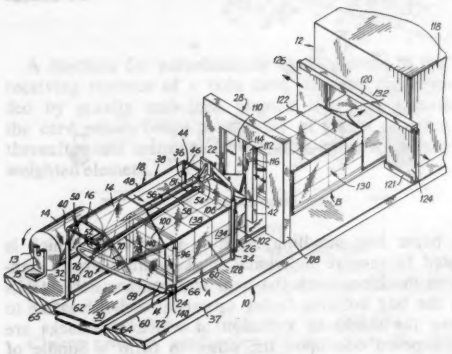
This invention is directed to apparatus for automatically sequentially delivering bags to a loading station, blowing the bags open and delivering an item to and inserting the item in a bag. The invention includes in particular means for positioning a box of bags in the apparatus and

delivering the bags in proper condition to the loading station, means for supplying a proper amount of air both in width of delivery and volume to open the bag, means



to control the reciprocation of the item delivery means and parts of the item delivery means and a method of packaging employing such an apparatus.

3,619,970
AUTOMATIC METHOD AND APPARATUS FOR THE WRAPPING OF ARTICLES
Seymour Zelnick, Orange, N.J., assignor to Weldotron Corporation, Newark, N.J.
Filed Nov. 25, 1969, Ser. No. 879,738
Int. Cl. B65b *11/08, 49/04, 43/06*
U.S. Cl. 53—30 **16 Claims**

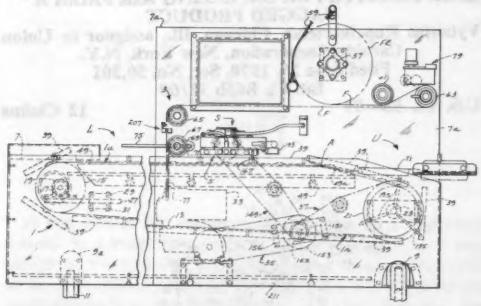


New and improved, automatic method and apparatus for the wrapping of articles in wrapping materials from a single center folded supply of the latter are provided and are effective to wrap said articles by the covering of the respective side, end and top surfaces thereof. The apparatus comprise means to withdraw the wrapping material from said supply and form an inverted, generally U shaped tube thereof, means to move articles into said tube and to advance said articles and said tube, and means to cut and seal said tube adjacent the respective leading and trailing end surfaces of the articles to complete the wrapping thereof. Gusset forming means are provided and are operable concomitantly with said cutting and sealing means to form gusset in said wrapping material tube attendant the cutting and sealing thereof to neatly control any excess wrapping material produced by said cutting and sealing and provide for the convenient containment of article identifying labels or the like in the article wrapping.

3,619,971
CONDITIONING METHOD AND APPARATUS FOR CARRYING IT INTO PRACTICE
Rene Claude, Sevres, France, assignor to Centre de Recherches Marcel Midy, Paris, France
No Drawing. Filed June 9, 1969, Ser. No. 831,717
Int. Cl. B65b *3/04*
U.S. Cl. 53—37 **1 Claim**

New conditioning method for use particularly in the pharmaceutic field, characterized in that a gelatin capsule is used in which is introduced, in the fused or unfused state, a mixture of at least one active compound and at least one non-oxidable fatty substance, of which the melting point is between about 30 and 40° C.

3,619,972
PACKAGING APPARATUS
Frank E. Pringle, David A. Wilson, and Richard H. Cochrane, Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.
Filed Dec. 5, 1969, Ser. No. 882,562
Int. Cl. B65b *7/28, 41/18*
U.S. Cl. 53—51 **8 Claims**

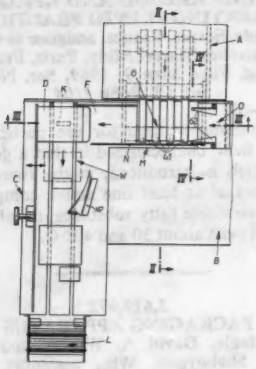


A machine for applying film covers to preformed trays in which filled trays are conveyed by a conveyor continuously through a sealing zone, a web of film is fed from a roll thereof to overlie the trays as they travel through the sealing zone, and the film is sealed to the trays by a platen which moves downward to press the film against the rim of a tray, then linearly forward in unison with the conveyor continuing to press the film against the rim for a sealing interval, then upward and then back to repeat the cycle, the film being cut between successive trays.

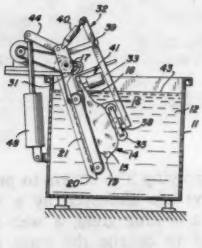
3,619,973
SEMIAUTOMATIC PACKING MACHINE FOR TEXTILES
Italo Della Bella, Gutenbergstrasse 9, Worrstadt (Rhine), Germany
Filed Nov. 14, 1968, Ser. No. 775,671
Claims priority, application Germany, Nov. 15, 1967, P 15 86 028.3
Int. Cl. B65h *43/36, 57/02;* **B65c** *9/18*
U.S. Cl. 53—64 **21 Claims**

A packing machine for textile goods including a bag forming device, a bag filling station, and a bag closing device which simultaneously applies suitable labels to one side of the bag. The bags may be filled manually or automatically by a novel sliding feed assembly which inserts

the goods into the bag and simultaneously removes the bag from a bag holding clamp. An additional novel labelling device may be provided to apply labels to the other side of the bag.



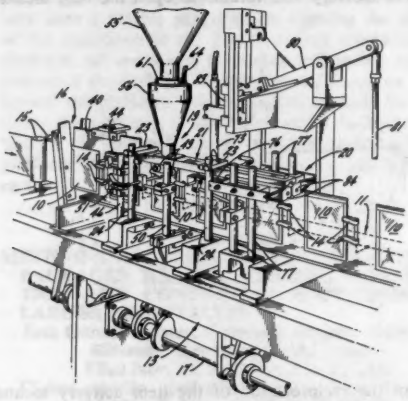
3,619,974
APPARATUS FOR EXPELLING AIR FROM A BAGGED PRODUCT
Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.
Filed June 26, 1970, Ser. No. 50,201
Int. Cl. B65b *31/00*
U.S. Cl. 53—79 12 Claims



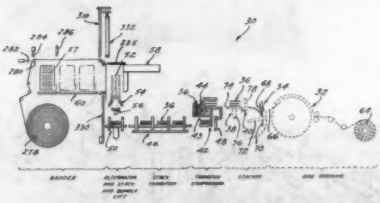
An apparatus for expelling air from a bagged product, such as a bagged meat product, is described. The apparatus includes a receptacle for containing a liquid, carrier means for immersing the bagged product in the liquid to expel the air from the bag, means for maintaining the open end of the bag above the level of the liquid while the bag is immersed in the liquid, and means for securely closing the open end of the bag while said bag is still immersed in the liquid.

3,619,975
MACHINE FOR PACKAGING PRODUCT IN A CONTROLLED ATMOSPHERE
Kenneth R. Johnson, W. Gerald Tyson, and Joe F. Soroka, Rockford, Ill., assignors to Riegel Paper Corporation, New York, N.Y.
Filed May 25, 1970, Ser. No. 40,250
Int. Cl. B65b *31/06*
U.S. Cl. 53—112 B 10 Claims

Pouches advanced along a horizontal path by a packaging machine are opened, filled and sealed while beneath a hood of comparatively small volume to which nitrogen is supplied to exclude the outside atmosphere from the pouches and the product deposited therein. The hood encloses only the upper ends of the pouches to leave the latter and various mechanisms for operating on the pouches accessible to the operator of the machine.



3,619,976
BAG BUNDLING MACHINE
William C. Kerker, deceased, late of Rye, N.Y., by Potdevin Machine Co., 200 North St., Teterboro, N.Y. 07608
Continuation-in-part of application Ser. No. 718,292, Feb. 19, 1968. This application Jan. 27, 1970, Ser. No. 6,188
(Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. B65h *13/20*
U.S. Cl. 53—124 C 24 Claims

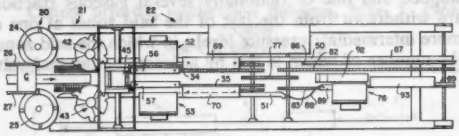


A paper bag bundling machine is provided which is adapted to remove individual bags produced by a bag-making machine, stack the bags and compress the stacks with the bag bottoms facing upwardly and thereafter to convey the stacks to a station at which the stacks are superimposed one upon the other to form a bundle of either standard configuration or long-pack configuration which bundle is further compressed and then banded to retain the compressed condition.

3,619,977
APPARATUS AND METHOD FOR HEAT SEALING CARTONS
Ezra E. Theys, San Mateo, Hugh B. Morse, San Jose, and Robert B. Johnson, Santa Clara, Calif., assignors to Fibreboard Corporation, San Francisco, Calif.
Filed Mar. 10, 1970, Ser. No. 18,122
Int. Cl. B65h *7/20, 7/26*
U.S. Cl. 53—376 22 Claims

An apparatus comprises carton feeding, folding and sealing stations for sequentially moving partially erected top-loaded frozen food cartons along a linear path, folding adhesively treated flaps thereof into superimposed relationship and for sealing the flaps together. The feeding station comprises horizontally disposed sorting wheels for precisely spacing and positioning the cartons onto a

conveying means which moves the cartons through the folding station. The folded side flaps of the carton are then moved past first heat sealing means in the sealing station to subject the side flaps and adjacent side portions



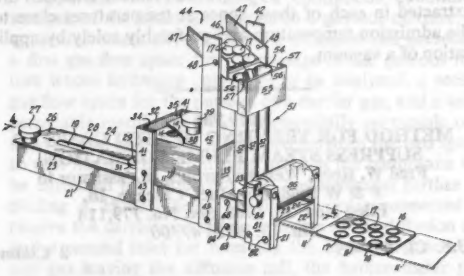
of a cover flap to heated air and to thereafter bond them together. The carton is then turned 90° to align a front flap and adjacent portions of the cover flap for bonding by a second heat sealing means.

3,619,978

COIN CARD LOADING MACHINE

George C. Graham, Ridgewood, N.J., assignor of a fractional part interest to I. Jordan Kunik, New York, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,414
Int. Cl. B65b *5/10, 35/30*
U.S. Cl. 53—160 10 Claims



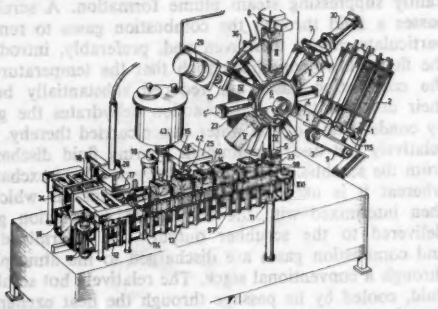
A machine for automatically loading coins in the coin receiving recesses of a coin card whereby the coins are fed by gravity and then pressed into said recesses as the card passes below a plurality of stacks of coins and thereafter said coins are further pressed into position by a weighted element.

3,619,979

PACKAGING MACHINE

Kjell Halvard Martensson, Malmo, and Lars Anders Karlsson, Akarp, Sweden, assignors to AB Tetra Pak, Lund, Sweden

Filed Oct. 17, 1969, Ser. No. 867,324
Claims priority, application Sweden, Oct. 30, 1968, 14,661/68
Int. Cl. B65b *7/10, 43/18*
U.S. Cl. 53—186 16 Claims



A machine for erecting, forming, filling and sealing package containers for products such as milk in which different sized packages may be employed and in which various elements of the machine may be adjusted or altered to accommodate the different sized package containers.

3,619,980

METHOD FOR REMOVING POLLUTANTS FROM THE ATMOSPHERE

Lester M. McKay, 16260 Kivitt Lane, Reno, Nev. 89502

No Drawing. Filed Aug. 19, 1968, Ser. No. 753,720
Int. Cl. B01d *47/00*
U.S. Cl. 55—84 5 Claims

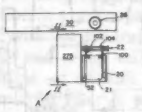
A method of removing pollutants from the atmosphere using the storm drains and/or sewer systems of a city. The downward pressure of a temperature inversion is used to cause the lower layer of the atmosphere to flow to catch basins or other openings in the drains and sewer systems. A series of low powered fans or water flow in the sewer is used to create a steady horizontal flow of air through the drains and sewer system.

3,619,981

BAG PLACER

Arthur J. Burke, Oakland, N.J., and Rudolf Keller, New York, N.Y., assignors to Howe Richardson Scale Company, Clifton, N.J.

Filed Dec. 16, 1968, Ser. No. 783,786
Int. Cl. B65b *43/30*
U.S. Cl. 53—190 16 Claims



A bag placer for automatically picking up a bag from a stack in a magazine, opening it and placing it on a bag holder or the spout of a supply hopper receiving material to be delivered to the bag. The apparatus for effecting the magazine-to-bag holder transfer and for opening the bag comprises a suction cup assembly which is dispalced back and forth between the magazine and the bag holder by a motor driven motion transmitting linkage mechanism. This linkage mechanism is constructed to displace the suction cup assembly along a motion path aproaching the configuration of an S and is defined by two oppositely curved portions which are smoothly joined together by a single point or region of inflexion. The linkage mechanism further translates uniform rotary motion of a power output member to accelerate the bag as it is transferred from the magazine to the bag holder along the S-shaped motion path.

3,619,982

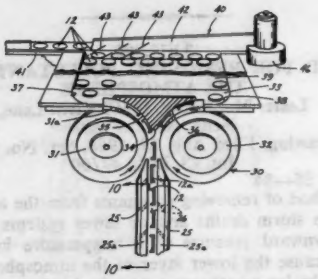
APPARATUS FOR ORIENTING CLOSURE CAPS AND THE LIKE

William H. Robinson, Rte. 1, New Vienna, Ohio 45159

Application Nov. 25, 1968, Ser. No. 778,441, which is a continuation-in-part of application Ser. No. 483,252, Aug. 27, 1965. Divided and this application July 31, 1970, Ser. No. 59,926
Int. Cl. B65b *7/28*
U.S. Cl. 53—314 2 Claims

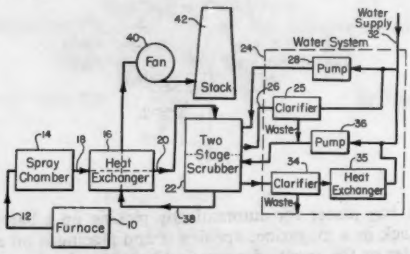
Articles which are dished or cup-like and forming an open side, for example flexible closure caps and the like, are unscrambled from a haphazard mass thereof and are positioned into a layer in which the open side of the respective closures may face in opposite directions. Articles are removed from the layer and are fed between moving

surfaces which advance the articles individually and positively to a desired oriented position. Upon removal from the moving surfaces, the oriented articles are arranged



in a moving layer from which they are thereafter separated and fed into registry with other articles for assembly therewith as in a container capping operation.

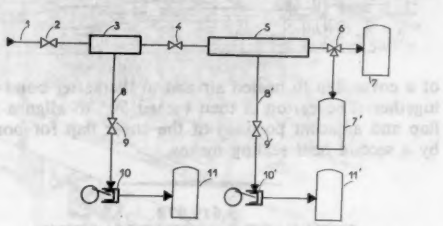
3,619,983
SUPPRESSION OF THE STEAM PLUME FROM INCINERATOR STACKS
Fred W. Rohr, Western Springs, Ill., assignor to P & W Engineers, Inc., Chicago, Ill.
Filed Nov. 26, 1968, Ser. No. 779,012
Int. Cl. B01d *47/00*
U.S. Cl. 55—89 **3 Claims**



Methods and apparatus for treating heated gases to remove particulate matter therefrom and to suppress steam plume formation upon discharge of the gases to the atmosphere are disclosed. Specifically, the gases are directed through a first heat exchanger passageway to a conventional scrubber system whereat substantially all of the particulate matter is removed from the gases. The scrubber also functions to reduce the temperature of the gases substantially below their dew point for effectively dehydrating the gases by condensation of the water vapor carried thereby. The dehydrated, scrubbed and cooled gases are passed through a second passageway of the heat exchanger and are reheated by intimate thermal contact with the gases passing through the first passageway, the gases in the first passageway being proportionally cooled. The reheated gases are then discharged to the atmosphere. Other features are disclosed.

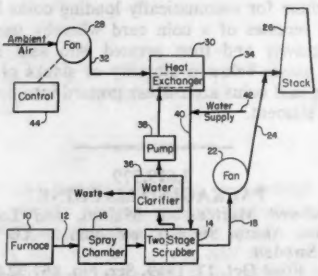
3,619,984
GAS SEPARATION BY ADSORPTION
Daniel Domine, Meudon, and Leon Hay, Paris, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France
Filed Sept. 19, 1969, Ser. No. 859,446
Claims priority, application France, Sept. 27, 1968, 168,900
Int. Cl. B01d *53/04*
U.S. Cl. 55—25 **10 Claims**

A process for separating a complex gaseous mixture formed of at least three constituents and for obtaining at least three of these constituents, in which a given quantity of mixture under pressure, at a given temperature, is admitted into several successive adsorption zones which have been evacuated, the admission of the mixture is stopped and one or optionally several gaseous fractions are withdrawn from the last of the said zones at one or more intermediate pressure levels, in which the said zones, the number of which is less by at least one integral value



than the number of constituents to be separated, and which contain different adsorption masses capable of selectively adsorbing at least one of the constituents of the gaseous mixture, are then isolated from one another, whereupon the selectively adsorbed residual fractions are extracted in each of these zones at temperatures close to the admission temperature and preferably solely by application of a vacuum.

3,619,985
METHOD FOR TREATING HEATED GASES TO SUPPRESS STEAM PLUME FORMATION
Fred W. Rohr, Western Springs, Ill., assignor to P & W Engineers, Inc., Chicago, Ill.
Filed Nov. 26, 1968, Ser. No. 779,114
Int. Cl. B01d *47/00*
U.S. Cl. 55—89 **2 Claims**



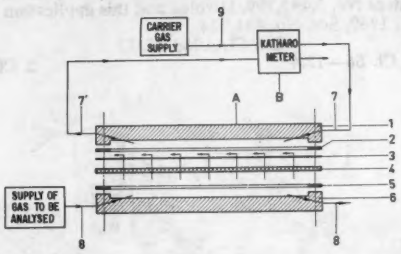
A method and system are disclosed for removing particulate matter from combustion gases and for concomitantly suppressing steam plume formation. A scrubber passes a fluid through the combustion gases to remove particulate matter therefrom and, preferably, introduces the fluid under conditions such that the temperature of the combustion gases are reduced substantially below their dew point; this latter action dehydrates the gases by condensation of the water vapor carried thereby. The relatively hot and contaminant bearing fluid discharged from the scrubber is circulated through a heat exchanger whereat it is utilized to preheat ambient air which is then intermixed with the dehydrated combustion gases delivered to the scrubber output. The intermixed air and combustion gases are discharged to the atmosphere through a conventional stack. The relatively hot scrubber fluid, cooled by its passage through the heat exchanger, is recirculated to the scrubber for repeated use, preferably after the fluid has been suitably clarified. Other features are disclosed.

3,619,986

QUANTITATIVE GAS ANALYSIS APPARATUS

Rene Mormont, Brussels, and Jean Duez, Ganshoren, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Mar. 7, 1969, Ser. No. 805,250
Claims priority, application Belgium, Mar. 7, 1968, 55,458
Int. Cl. B01d *53/22*
U.S. Cl. 55—158 6 Claims



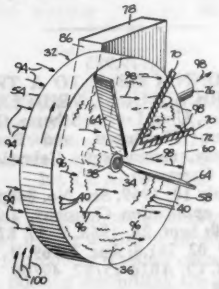
Apparatus for performing a continuous quantitative analysis of the hydrogen present in a gaseous mixture, the apparatus essentially including a diffusion cell presenting a first gas flow space for the passage of the gaseous mixture whose hydrogen content is to be analyzed, a second gas flow space for the passage of a carrier gas, and a semi-permeable membrane which is essentially permeable only to hydrogen and which is disposed between the two spaces so that the hydrogen diffusing through the membrane will be entrained by the carrier gas, the apparatus further including a katharometer having one inlet connected to receive the carrier gas before it passes to the diffusion cell and a second inlet for receiving the hydrogen-laden carrier gas leaving the diffusion cell, the katharometer providing an indication of the difference between the thermal conductivities of the two gases which it receives, which difference is representative of the initial hydrogen content of the gaseous mixture being analyzed.

3,619,987

DEVAPORIZING SYSTEMS

Oliver D. Colvin, Hampton, N.H., Robert A. Taylor, Newburyport, Mass., and Samuel C. Kelly, Exeter, N.H., assignors to Oliver D. Colvin, Hampton, N.H.

Continuation-in-part of application Ser. No. 574,875, Aug. 5, 1966, now Patent No. 3,490,201. This application Nov. 10, 1969, Ser. No. 875,415
Int. Cl. B01d *19/00*
U.S. Cl. 55—196 21 Claims



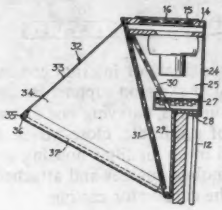
Air dehumidifier systems for containerized cargo comprising a rotating wheel containing hygroscopic lined passageways and special internal ductwork, heating and cooling apparatus arranged to dry air from the container and simultaneously reactivate the wheel passageways.

3,619,988

FILTERING AND MOISTURE CONTROL DEVICE

Dudley E. Cornell III, 221 San Pedro NE., Albuquerque, N. Mex. 87108

Filed Feb. 14, 1969, Ser. No. 799,193
Int. Cl. B01d *47/00*
U.S. Cl. 55—234 11 Claims



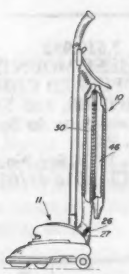
Device for filtering air and control of moisture therein, preferably by humidifying the air. The device is adapted to be supported over the head portion of a bed and includes a blower mounted in a housing. Air from the outlet of the blower flows into an enlongated chamber extending horizontally in a direction transverse to the length of the bed with a combination filtering and evaporating member of porous material forming one wall of the chamber and having a lower portion in a water pan in the lower portion of the chamber and with flexible transparent sheet forming triangular side walls and a top wall extending angularly downwardly to define a conduit extending toward a sleeper's head. A micron filter is preferably provided in the conduit and is so positioned as to produce a laminar flow of the air.

3,619,989

VACUUM CLEANER BAG

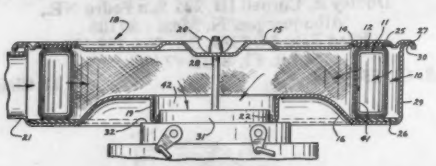
Sol Howard and Robert Schaaf, Brooklyn, N.Y., assignors to Mil-An Mfg. Corp., Brooklyn, N.Y.

Filed Apr. 3, 1969, Ser. No. 813,151
Int. Cl. B01d *46/02*
U.S. Cl. 55—368 5 Claims



A multi-compartment vacuum cleaner bag formed of an air permeable material comprising a first bag tube member and a second bag tube member, said bag tube members being interconnected, said first bag tube member being adapted to be connected to a vacuum cleaner, the interior of said first bag tube member being in air-flowing relation with the interior of said second bag tube member, said second bag tube member being openable at one end thereof.

3,619,990
CARBURETOR AIR FILTER UNIT
Michael L. Gayda, 11309 Kell Road, Bloomington, Minn. 55431
Filed June 12, 1970, Ser. No. 45,731
Int. Cl. B01d 27/08
U.S. Cl. 55—482 5 Claims

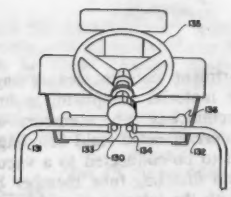


An improved air filter for internal combustion engines, including an annular skeleton support structure having flat top and bottom surfaces, carrying one or more enveloping filtering sleeves of a durable, close-woven fabric. The air filter is contained in an air filter housing commonly associated with automobile engines and attached to the air intake portion of the carburetor casting.

3,619,991
COTTON HARVESTING METHODS AND COMPOSITIONS
William A. Erby, Downers Grove, Ill., and Robert A. Walde, Emmaus, Pa., assignors to Air Products and Chemicals Inc., Philadelphia, Pa.
No Drawing. Continuation-in-part of application Ser. No. 714,761, Mar. 21, 1968. This application Sept. 9, 1968, Ser. No. 758,577
Int. Cl. A01d 45/20, 45/18
U.S. Cl. 56—1 9 Claims

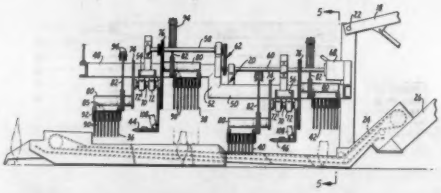
Methods of harvesting cotton are disclosed which rely upon the unique effects of salts of 2,3,5,5,5-pentachloro-4-keton pentenoic acid, particularly those salts made with ammonia and C_1–C_{18} organic amines. Depending upon the rate of application to living cotton plants, these effects vary. They include quick wilting followed by defoliation, thus permitting a first picking after initial wilting and, if desired, a second picking after defoliation. With other dosage rates, the quick wilting may be followed by desiccation rather than by defoliation, thus permitting a first picking in wilted condition followed by strip harvesting of the remaining cotton. The salts may also be used either as desiccants, per se, or as defoliants which both defoliate the plant and promote boll opening. Agricultural formulations are also disclosed.

3,619,992
STEERING WHEEL MOUNTING ON A SELF-PROPELLED COMBINE
John E. Brelsford, Terre Hill, and Edmund O. Howell, New Holland, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed July 1, 1970, Ser. No. 51,431
Int. Cl. A01d 41/02
U.S. Cl. 56—10.1 12 Claims



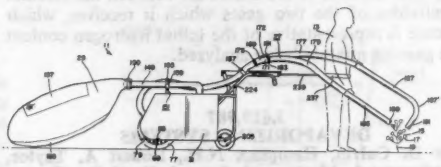
A U-shaped support on the operator's platform of a self-propelled combine has a hydraulic steering and control valve and an enclosing casing pivotedly mounted thereon. A steering wheel actuates the valve. The U-shape of the support provides a clear viewing of the forward part of the header.

3,619,993
HARVESTING MACHINE
Jack D. Maffei, Gustine, Calif., assignor to L. D. Maffei Seed Company, Newman, Calif.
Original application Oct. 17, 1966, Ser. No. 587,171, now Patent No. 3,492,799. Divided and this application Apr. 21, 1969, Ser. No. 834,924
Int. Cl. A01d 45/22
U.S. Cl. 56—12.4 2 Claims



A vegetable harvesting machine having a rotary orbital vegetable beater guided by a knee action drive mechanism which holds the picking tines of the beater on one side of the beater orbital path as the beater swings around the path.

3,619,994
MANUALLY DIRECTED COTTON HARVESTING MACHINE
William E. Rohde, 2849 Invergarry Road, Memphis, Tenn. 38128
Filed Dec. 4, 1969, Ser. No. 882,040
Int. Cl. A01d 45/20
U.S. Cl. 56—13.1 16 Claims

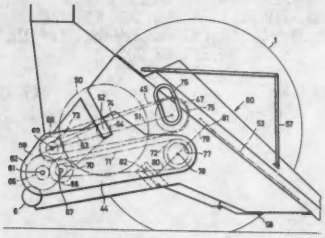


A cartlike machine to be used in harvesting seed cotton. The machine includes a centrifugal air blower powered by an internal combustion engine, a self-propelled mobile carriage assembly having a semi-automatic propulsion system which is actuated as the workman progresses along the row of cotton plants, a bifurcated hand-held nozzle assembly for pulling the cotton locks from the cotton boll and a receptacle bag which trailingly follows the machine.

3,619,995
APPARATUS CONNECTIBLE TO A TRACTOR OR AGRICULTURAL VEHICLE
Alfred Eggenmuller, Ulm, Lorenz Scherer, Oberelchingen, Heinrich Bellan, Thalfingen, and Rudolf Wöhrle, Rieden, Germany, assignors to Gebruder Eberhardt, Ulm (Danube), Germany
Filed July 10, 1969, Ser. No. 840,692
Claims priority, application Germany, July 11, 1968, P 17 82 045.0; Sept. 28, 1968, P 17 82 656.1; Jan. 21, 1969, P 19 02 761.8; Apr. 3, 969, P 19 17 307.0
Int. Cl. A01d 45/02, 49/00
U.S. Cl. 56—13.4 7 Claims

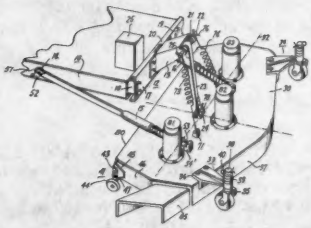
Lifting means applicable to a tractor having a three-point hydraulic lift mechanism and applicable to a tool adapted for operation alongside of the tractor, such as a

corn picker, binder or mower. It is particularly adaptable to tools having a relatively long extent in the direction of movement of the tractor, such as a corn picker. The mechanism lifts the tool at such a point in relation to the



center of gravity of the tool that the weight of the tool assists in maintaining same when lifted in a position approximately parallel with the ground. Snubbing and auxiliary support mechanism are provided for use if desired to assist further in support and guidance of the tool.

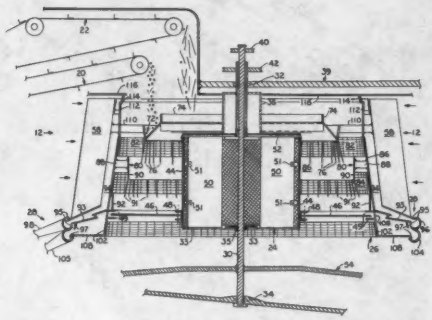
3,619,996
MOWER APPARATUS
Chester F. Jacobson, Scotia, and Edward P. Kexel, Altamont, N.Y., assignors to General Electric Company
Filed Feb. 12, 1970, Ser. No. 10,865
Int. Cl. A01d *35/26*
U.S. Cl. 56—13.6 **8 Claims**



A pair of spring loaded pusher rods connect the deck or housing of the mower to the chassis of the tractor. One end of each of the rods is pivotally connected to a respective side of the chassis and the other end of each of the rods is secured to the deck by a respective ball joint assembly. Springs also connect the deck to the front end of the chassis to facilitate operation of the mower in association with a tractor. A capability is also provided for enabling the mower to be lifted off the supporting surface without exposing the blades of the mower.

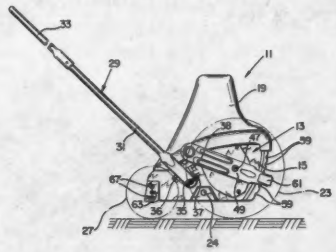
3,619,997
SEPARATOR MEANS FOR COMBINES
Kenneth D. Wood, 1826 Greenfield, Wichita, Kans. 67217
Filed Mar. 4, 1970, Ser. No. 16,464
Int. Cl. A01d *41/12*
U.S. Cl. 56—14.6 **8 Claims**

This invention is a separator means for combines which have a reel and header assembly, thresher cylinder, conveying means for moving threshed cereal grass, powering means, and a housing comprising the structure thereof. The separator means is comprised of an independently rotatable outer cylinder member mounted within and powered by the combine. In operation the outer cylinder rotates about its longitudinal axis and receives threshed material from the conveyor, disposes same through a distribution means to a grain-stalk separator, and draws air radially inward against the motion of the grain, separating same from its stalk. The separated grain passes to a grain



collector. Air is drawn through the wall of the cylinder member and is discharged downward with the separated stalk segments. The separator uses rotation and centrifugal force and opposed airflow to separate threshed cereal grass stalk and grain.

3,619,998
HANDLE HEIGHT ADJUSTMENT
Kenneth R. Wells, Joppa, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Feb. 9, 1970, Ser. No. 9,573
Int. Cl. A01d *55/20*
U.S. Cl. 56—249 **5 Claims**

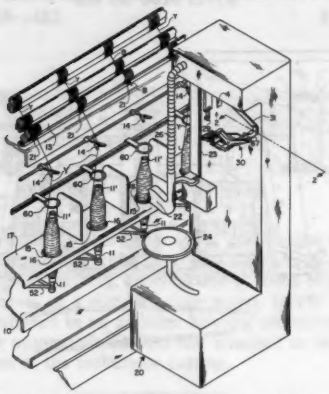


A lawn mower including a housing supported by wheels for movement over the ground. A reel is rotatably supported upon the housing and is driven by a motor also on the housing. The mower is manipulated and controlled by an upstanding handle on the housing. The cutting height of the reel is adjusted by adjusting the wheels relative to the housing and a novel means and arrangement is provided whereby a range of handle heights are provided for the different cutting heights.

3,619,999
YARN PIECING APPARATUS
Roberto Escursell-Prat, Rda. General Mitre, 105 4.°, 1.°, Barcelona 6, Spain
Filed Apr. 1, 1969, Ser. No. 812,054
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **11 Claims**

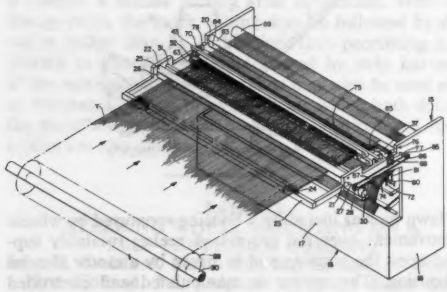
Automatic yarn piecing apparatus for textile machines, such as a spinning machine of the ring and traveller type, wherein a piecing head of improved construction joins yarn passing from the machine's delivery rolls to yarn

extending upwardly from a bobbin. The piecing head is constructed so as to consistently bring the yarn ends together while imparting twist to the bobbin yarn and



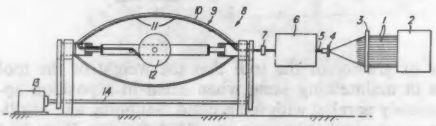
otherwise under controlled conditions calculated to reliably join the yarn ends. Tension control means are provided to discourage yarn breakage during piecing.

3,620,000
YARN TWISTING APPARATUS
William K. Wyatt, Lansdale, Pa., assignor to Turbo Machine Company, Lansdale, Pa.
Original application Nov. 17, 1967, Ser. No. 683,908, now Patent No. 3,488,936, dated Jan. 13, 1970. Divided and this application July 28, 1969, Ser. No. 854,007
Int. Cl. D02g *1/04*; D04b *15/38*
U.S. Cl. 57—34 HS **12 Claims**



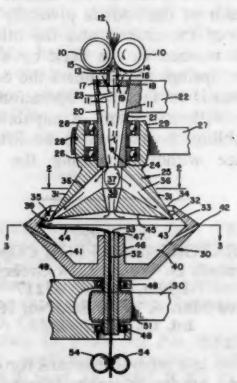
An apparatus is provided, for machine twisting a plurality of warp yarns simultaneously, the apparatus being adapted to be mounted directly onto the frame of a knitting, weaving machine or the like, for providing an initial twisting of yarns, prior to feeding the yarns into a knitting portion of a knitting machine. After the initial twist is placed in the yarns, by false twisting pairs of yarns together, the yarns are moved longitudinally through another portion of the apparatus, in which yarns in the twist zone are heated to set the filaments in their twisted condition, the twisted yarns then being cooled by a suitable means, and then being separated by passing the yarns in a twisted pair over opposite sides of a separating pin, to yield a texturized fabric.

3,620,001
METHOD OF AND APPARATUS FOR TWISTING TOGETHER A PLURALITY OF ELONGATED FLEXIBLE ELEMENTS
Horace Herbert Daker, Sidmouth, Devon, Raymond Alfred Martin, Lancashire, and John Rose, Cheshire, England, assignors to British Insulated Callender's Cables Limited, London, England
Filed May 26, 1969, Ser. No. 834,930
Claims priority, application Great Britain, May 28, 1968, 25,535/68
Int. Cl. D01h *1/10*
U.S. Cl. 57—58.57 **17 Claims**



A plurality of wires or other elongated flexible elements taken from stationary supply devices are assembled to form a bunch. The bunch is advanced and rotated by a stationary drawing device, which may be a skew roll or an endless belt, having an endless gripping surface which moves in a closed path and engages the bunch over a part of that closed path which is obliquely inclined with respect to the axis of the bunch. The rotating bunch is taken up by a double-twist bunching machine whose flyer rotates in the same direction as the bunch but at a lower speed.

3,620,002
OPEN END SPINNING ASSEMBLY AND METHOD
Peter F. Grishin, Sanford, N.C., assignor to Roberts Company, Sanford, N.C.
Filed Mar. 17, 1969, Ser. No. 807,662
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.89 **8 Claims**



An open end spinning assembly and method in which preferably individual fibers are separated in a first zone

from a fibrous supply mass to flow in a substantially non-turbulent air stream, preferably accelerated flow, in a directed path of travel for deposition on a surface of a rotating centrifugal turbine for fiber removal therefrom as a spun yarn in another zone remote from the first zone where the fibers are introduced.

3,620,003
NOVELTY YARN AND METHOD OF FORMING SAME

Sohinger Nath Chopra, Hawkesbury, Ontario, Canada, assignor to Chemcell Limited, Montreal, Quebec, Canada

No Drawing. Filed Feb. 11, 1970, Ser. No. 10,633
Int. Cl. D02g *3/04, 3/34*
U.S. Cl. 57—140 **13 Claims**

A novelty singles yarn comprising fibrillated polymeric staple fibres and non-fibrillated staple fibres, characterized in that most of the fibrillated polymeric staple fibres stay on the periphery of the yarn to form a shell surrounding the non-fibrillated staple fibres. A novelty carpet is made from said yarn.

The process of making a novelty yarn made up of fibrillated polymeric staple fibres and non-fibrillated staple fibres, comprising:

(a) blending staples of at least one fibrillated polymeric staple fibre with staples of at least one non-fibrillated synthetic, or natural fibre,

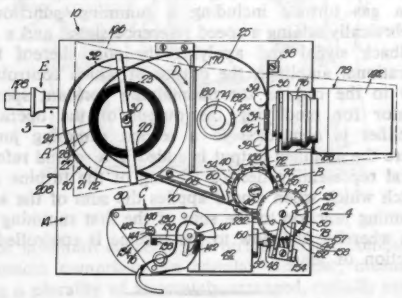
(b) carding the said blend into a sliver,

(c) drafting and spinning the sliver to form a yarn having fibrillated polymeric staple fibres mostly emerging out on the periphery of the said yarn as a shell surrounding the other filaments or fibres which form a core.

3,620,004
TIME INDICATING DEVICE OF DIRECT READ-OFF TYPE

Frank H. Marz, Delavan, Wis., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Sept. 25, 1969, Ser. No. 861,092
Int. Cl. G04c *3/00;* **G04b** *19/30*
U.S. Cl. 58—23 **4 Claims**

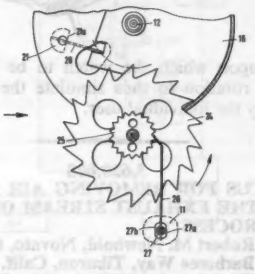


Device using film with successive frames bearing different indicia, and having means for step-by-step advancement of the film in synchronism with the passage of time, with successive frames pausing in register with a film gate for image projection of their indicia onto a screen, and the device having further provision for manually controlled rapid advance or retraction of the film.

3,620,005
RATCHET WHEEL DEVICE FOR A BALANCE WHEEL CLOCK

Wolfgang Ganter, Schramberg-Sulgen, Wurttemberg, and Heinz Otto, Rotenberg, Wurttemberg, Germany, assignors to Messrs. Gebruder Junghans Gesellschaft mit beschrankter Haftung, Schramberg, Wurttemberg, Germany

Filed Oct. 2, 1968, Ser. No. 764,450
Claims priority, application Germany, Oct. 4, 1967, J 17,022
Int. Cl. G04c *3/04*
U.S. Cl. 58—28 D **3 Claims**

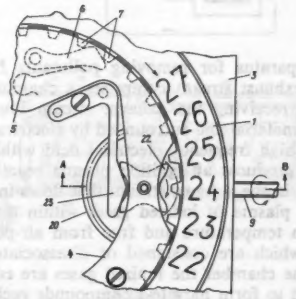


A ratchet wheel mechanism for a watch or clock having a common shaft with a balance wheel with a permanent magnet and of which a pawl wheel, and ratchet wheel with drive are composed of an anti-magnetic material resistant to wear.

3,620,006
CALENDAR WATCH SETTING MECHANISM

Roland Zaugg, Grenchen, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Oct. 3, 1969, Ser. No. 863,442
Claims priority, application Switzerland, Oct. 11, 1968, 15,252/68; June 4, 1969, 8,523/69
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **9 Claims**



A mechanism for setting the minute and hour hands and the date indicator of a watch involving an axially shiftable setting stem and means to permit relative movement between the date indicating member and its setting drive member.

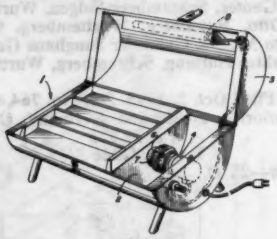
3,620,007
WATCH WINDING APPARATUS

Robert C. Kauffman, 342 Windemere Ave., Lansdowne, Pa. 19050

Filed July 13, 1970, Ser. No. 54,450
Int. Cl. G04b *5/20*
U.S. Cl. 58—80 **7 Claims**

This device consists of an apparatus for winding a self-winding watch when not worn by an individual so that there is no interruption between its respective carriers, there being provided a small electric motor having a slow

speed output shaft upon which a generally cylindrical supporting device is coaxially mounted for rotation there-



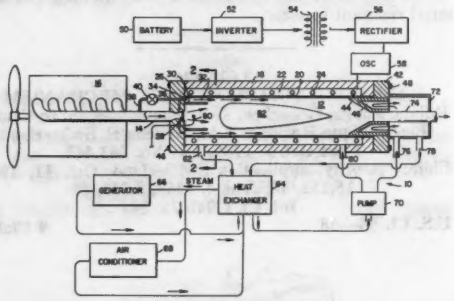
with and upon which the watch to be wound may be placed for rotation to thus simulate the winding action imparted by the individual user.

3,620,008

APPARATUS FOR REMOVING AIR POLLUTANTS FROM THE EXHAUST STREAM OF A COMBUSTION PROCESS

Robert M. Newbold, Novato, Calif.
(67 Barbaree Way, Tiburon, Calif. 94920)

Filed July 23, 1970, Ser. No. 57,588
Int. Cl. F01n 3/14; H05h 1/18
U.S. Cl. 60—30 **12 Claims**



An apparatus for removing pollutants from a combustion exhaust stream comprises a chamber having an inlet for receiving the exhaust stream lined with heat resistant material and surrounded by electrical means providing a high frequency electrical field within the chamber that produces an ignition plasma reaction to ionize the gases in the exhaust stream that flows into the chamber. The plasma of ionized gases within the chamber is at a high temperature and free from air-polluting compounds which are consumed or disassociated. Near the exit of the chamber the ionized gases are cooled and recombined to form harmless compounds such as the normal air gases of nitrogen and oxygen. In an automobile installation the high frequency electrical power is provided through a closed system from a standard battery and heat removed from the ionized gases is utilized for auxiliary power.

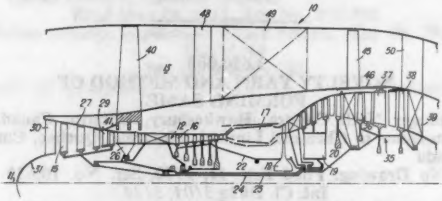
3,620,009

GAS TURBINE POWER PLANT

Geoffrey Light Wilde, Derby, England, assignor to Rolls-Royce Limited, Derby, England

Filed Dec. 2, 1969, Ser. No. 881,374
Claims priority, application Great Britain, Dec. 4, 1968, 57,599/68
Int. Cl. F02c; F02k
U.S. Cl. 60—39.16 R **9 Claims**

A turbo-fan power plant is disclosed in which there are two independent fans in the fan duct respectively driven by a gas generator and an independent free turbine. The gas generator includes in axial flow series low, intermediate and high pressure compressors respectively drivingly interconnected with high, intermediate and low pressure turbines, the intermediate pressure turbine being driving-



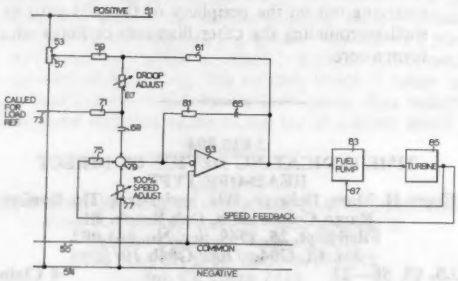
ly connected to the upstream or front fan of the two fans. The drive arrangement of the fans and their axial spacing enables them to rotate at relatively low speeds and substantially without any wake interaction therebetween, whereby the overall noise of the power plant is reduced.

3,620,010

GAS TURBINE SPEED-LOAD CONTROL

Richard K. Davis, Roanoke, Va., assignor to General Electric Company

Filed Feb. 2, 1970, Ser. No. 7,788
Int. Cl. F02c 9/06
U.S. Cl. 60—39.28 **2 Claims**



A circuit for controlling the speed-load characteristics of a gas turbine including a summing punction for algebraically adding a speed reference signal and a speed feedback signal and applying the sum thereof to an operational amplifier, the output of which controls fuel flow to the turbine for maintaining constant speed. A resistor for modifying the output of the operational amplifier is connected to a second summing junction where the modified output is added to a second reference signal representing desired loading of the turbine and a switch which when closed applies the sum of the second summing junction to the sum of the first summing junction whereby fuel flow to the turbine is controlled as a function of load.

3,620,011

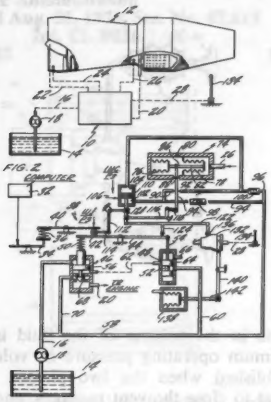
COMPRESSOR PRESSURE LIMITER FOR GAS TURBINE ENGINE

Louis A. Urban, Granby, and William E. Fortmann, Simsbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation of application Ser. No. 717,194, Mar. 29, 1968. This application Mar. 25, 1970, Ser. No. 20,469
Int. Cl. F02c 9/08, 3/06, 3/24
U.S. Cl. 60—39.28 **14 Claims**

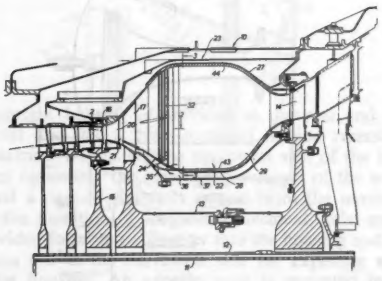
Compressor discharge pressure of a gas turbine engine is limited by closing off the fuel metering valve at a

velocity dependent on the magnitude by which the compressor discharge pressure exceeds a desired value. In this mode the fuel control becomes an integrating device



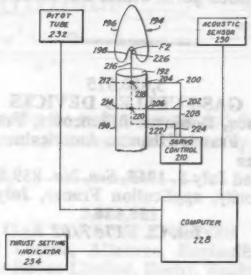
and steady state is achieved by closing the loop on compressor discharge pressure through the engine. The limit may be reset by the power lever and may be altitude pressure or temperature biased.

3,620,012
GAS TURBINE ENGINE COMBUSTION EQUIPMENT
Geoffrey Light Wilde, Derby, England, assignor to Rolls-Royce Limited, Derby, England
Filed Mar. 2, 1970, Ser. No. 15,721
Claims priority, application Great Britain, Mar. 21, 1969, 15,025/69
Int. Cl. F02c *3/06*
U.S. Cl. 60—39.36 **9 Claims**

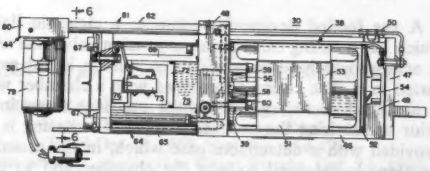


The invention concerns gas turbine engine combustion equipment comprising an annular chamber, means defining a plurality of alternately arranged, radially extending, primary combustion zones and diffusing dilution air passages, said means being mounted within an upstream portion of the flame tube, the annular chamber having a downstream portion within which mixing is effected between the combustion gases from the said zones and the dilution air from the said passages, and means for supplying fuel and air to each said zone, the annular chamber having a diffusing inlet duct which supplies dilution air to the said passages and a rotatable assembly of vanes which are located in the diffusing inlet duct and which effect diffusion of the air flowing thereover.

3,620,013
NOISE ABATEMENT METHODS RELATING TO FLAME AND JET PRODUCTION AND ASSOCIATED APPARATUS
James H. Rogers, 82 Bretton Road, and William G. Dunn, 132 Autumn Drive, both of Hauppauge, N.Y. 11787
Filed Oct. 31, 1969, Ser. No. 873,017
Int. Cl. F02c *7/00;* **F23d** *13/04*
U.S. Cl. 60—39.72 P **16 Claims**



Two noise abatement techniques are employed in connection with flame generation and the production of jets. One of these techniques involves introducing a disruption rod or needle at the focal point of the parabolic section of the apex of the inner cone of a flame. The other involves using a rod or rods for cancelling the resonant node or nodes developed in a supply tube by a combustible medium passing therethrough to the flame production zone. The apparatus uses the above techniques separately or in combination and provides controls for adjusting node cancelling rods and/or disrupting rod or needle performing the aforesaid functions. The controls take into account that the nodes and focal point vary according to fuel supply rate and other factors relating to ambient and associated conditions.

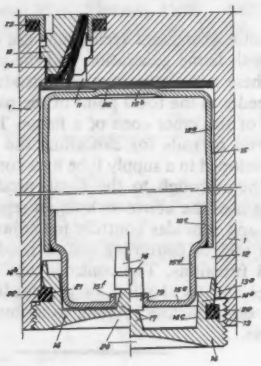


3,620,014
AUTOMATIC DOOR ACTUATOR
Richard Klein, San Lorenzo, Calif., assignor to American Metal Climax, Inc., New York, N.Y.
Filed July 7, 1969, Ser. No. 839,375
Int. Cl. F15b *15/18*
U.S. Cl. 60—51 **11 Claims**

There is provided an electro-hydraulic door actuator including an electrical control module, a power pack, and a door actuator. The power pack includes a fully submerged motor pumping fluid under high pressure into an accumulator or reservoir. The motor operates in response to the pressure demand for fluid within the accumulator. A control valve assembly responsive to signals from the electrical control module controls the flow of high pressure fluid, and the return thereof, from the door actuator. The door actuator includes a pair of pistons operable within respective cylinders, and driving a rack connected

to a pinion on the spindle of the door. When the electrical control module calls for a power opening cycle, a spool valve opens a port allowing high pressure fluid to drive one of the pistons in the door opening direction. The door actuator is also ported for a manual operation, in the normal power opening direction, and a panic opening, which would be in the opposite direction from the power opening cycle. The actuator can be readily modified from a right hand actuator to a left hand actuator by the mere reversal of a manifold plate which alters the connection of various ports within the actuator assembly.

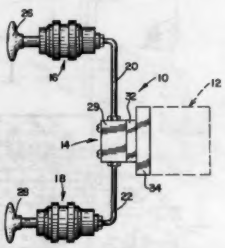
3,620,015
GAS-FUELLED DEVICES
Robert R. Hocq, Boulogne-Billancourt, France, assignor to Société Franco-Hispano-Americaine Francispam, Paris, France
Filed July 8, 1969, Ser. No. 839,835
Claims priority, application France, July 10, 1968, 158,626
Int. Cl. F17c *7/02*
U.S. Cl. 60—52 **9 Claims**



A gas fuelled device, for example a cigarette lighter, which has a casing carrying an expansion valve and which is arranged to have a cartridge containing liquid gas inserted in it. The casing is provided with a chamber which is arranged so that gas from the cartridge flows into it prior to reaching the expansion valve. The casing is also provided with a detachable base which, in the assembled position, is arranged to seal the chamber and to cause gas in the cartridge to flow automatically into the chamber.

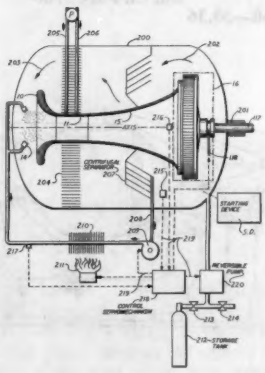
3,620,016
MACHINE CONTROL SYSTEM
Lee A. Wright, Kellering, Ohio, assignor to Mosier Industries, Inc.
Filed Jan. 21, 1970, Ser. No. 4,626
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.5 **11 Claims**

The control system includes at least two units which must be operated substantially simultaneously to start operation of a machine. Each unit includes a fluid displacement device, such as a device including a cylinder, a piston movable in the cylinder, a vent passage in the piston and a seal for closing the vent passage when the piston is moved in the cylinder to displace fluid therein. Each cylinder is connected to a chamber having a pressure sensitive transducer, valve or switch associated therewith which is actuated only when a predetermined minimum fluid pressure or minimum fluid volume is established in the chamber by reason of fluid displacement in the units which causes compression of the fluid in the chamber or



an increase in the volume of the fluid in the chamber. This minimum operating pressure or volume increase is only established when the two pistons are moved together, first to close the vent passages, and second to displace the fluid trapped in the cylinders.

3,620,017
POWER DENSITY CONTROL FOR FLUID-DYNAMIC ENGINES
Giusto Fonda-Bonardi, Los Angeles, Calif., assignor to Robert S. Estes, Emmett Steele, Jay Kurtz, James Linahan, and Carl Clement, Los Angeles, Edward S. Merrill, Palm Springs, and Royal M. Galvin, Pacific Palisades, Calif., fractional part interest to each
Filed June 24, 1969, Ser. No. 836,046
Int. Cl. F01k *3/18*; F02k *1/00*
U.S. Cl. 60—59 **8 Claims**



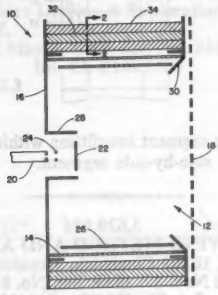
This invention relates to the method and apparatus for controlling the power density of a fluid dynamic engine wherein gas is accelerated through the engine at the speed of sound at the sonic speed of the gas and imparting energy to the gas while maintaining it at the sonic speed. The engine may comprise a duct having a sonic duct section interposed between convergent and divergent sections so that the fluid is successively accelerated to the sonic speed through the convergent section and moves through the sonic section at the sonic speed. The engine may be enclosed in order that the entire thermodynamic cycle may take place inside a pressure tight envelope.

3,620,018

ION THRUSTER MAGNETIC FIELD CONTROL

Bruce A. Banks, Olmsted Township, Cuyahoga County, Ohio, assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 28, 1970, Ser. No. 67,815
Int. Cl. F03h *5/00*
U.S. Cl. 60—202 10 Claims



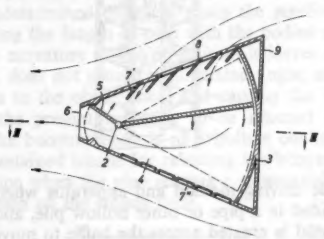
The magnetic field of an ion thruster is automatically shunted when the thruster is not operating.

3,620,019

JET PROPULSION DRIVE FOR WATERCRAFT

Harm-Heinrich Munte, Hamburg, Germany, assignor to Blohm & Voss AG, Hamburg, Germany

Filed Dec. 15, 1969, Ser. No. 884,796
Claims priority, application Germany, Dec. 18, 1968, P 18 15 313.4
Int. Cl. B63h *11/07*
U.S. Cl. 60—221 8 Claims



An upright housing is provided at the rear end of a watercraft and has a cross-sectional outline resembling a symmetrical trapezium.The narrowest side of the housing faces oppositely the intended movement of the watercraft and a pair of sidewalls extend from the narrowest side in the direction of intended movement. Inlet means are provided for admitting water into the housing and outlet means are in the narrowest side for expelling water from the housing. An expello vane is mounted in the housing for pivotal movement intermediate the respective side walls about an upright axis extending through the housing in the region of the outlet means.

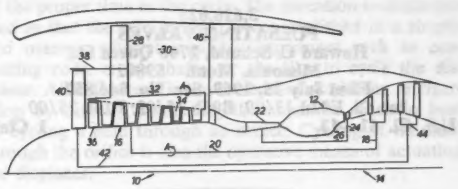
3,620,020

GAS TURBINE ENGINE

David George Halliwell, Allestree, Michael Vaughan Outram, Eggington, and Martin Hume Bryan-Brown, Etwall, England, assignors to Rolls-Royce Limited

Filed Apr. 14, 1970, Ser. No. 28,360
Claims priority, application Great Britain, Apr. 16, 1969, 19,360/69
Int. Cl. F02k *3/04*
U.S. Cl. 60—226 2 Claims

A gas turbine by-pass engine has a compressor means, a combustion means and a turbine means, a rotatable main fan extends completely across the by-pass duct and a secondary fan is positioned upstream of the main fan and extends only partially across the by-pass duct. The secondary fan is driven by the turbine means and the main fan is mounted on a casing having blades driven by the compressor means.

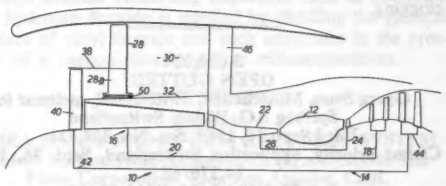


3,620,021

GAS TURBINE ENGINES

Brian Wilfred Lawrie, Allestree, England, assignor to Rolls-Royce Limited, Derby, England

Filed Apr. 14, 1970, Ser. No. 28,361
Int. Cl. F02k *3/04*
U.S. Cl. 60—226 5 Claims



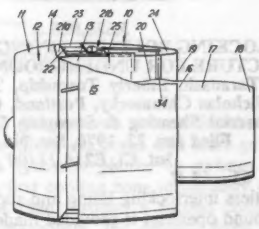
A gas turbine by-pass engine has a compressor means, a combustion means and a turbine means, a freely rotatable main fan extends completely across the by-pass duct and a secondary fan is positioned upstream of the main fan and extends only partially across the by-pass duct, the secondary fan being driven by the turbine means.

3,620,022

THRUST REVERSER FOR JET PROPULSION ENGINES

Richard D. Beale, Derby, England, assignor to Rolls-Royce Limited, Derby, England

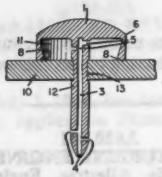
Filed Oct. 7, 1969, Ser. No. 864,473
Claims priority, application Great Britain, Oct. 24, 1968, 50,568/68
Int. Cl. F02k *1/20, 3/04*
U.S. Cl. 60—226 A 6 Claims



A fan thrust reverser for a jet engine has an annular deflecting gap in the outer wall of the fan duct, and has pivotally mounted vanes at the downstream end of the

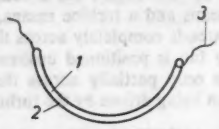
duct, a ram being provided to cause a helically movable wall member to cover or uncover the gap while also causing the vanes to unblock or block the fan duct, respectively.

3,620,023
PULSATING VALVES
Howard C. Schmid, 2700 Queen St., Missoula, Mont. 59801
Filed July 25, 1969, Ser. No. 844,857
Int. Cl. E02d *13/00*; B05b *15/02*; F16k *25/00*
U.S. Cl. 61—13 1 Claim



A device for use in sub-surface soil irrigators which pulsates from water pressure preventing ingress of roots and soil having a flexible feeder tube to prevent inlet clogging.

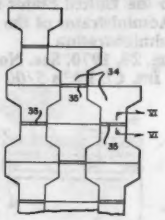
3,620,024
OPEN GUTTER
Georg Senn, Mutschellen, Switzerland, assignor to Spribag AG, Widen, Switzerland
Filed Sept. 16, 1969, Ser. No. 858,421
Claims priority, application Switzerland, Sept. 26, 1968, 14,370/68
Int. Cl. E02d *9/04*; E04d *13/06*
U.S. Cl. 61—14 8 Claims



A novel open gutter or drain for diverting liquids is disclosed, said gutter being characterized by the provision of a foil strip which is rigidly connected with at least one reinforcing element. The foil strip is deformed about its longitudinal axis thus bending the reinforcing element, the cross-section of the gutter so formed being arcuate in shape. The novel open gutter is such that it can easily be displaced in all directions without effecting a change in its cross-sectional configuration.

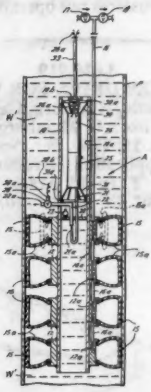
3,620,025
INTERLOCKING BOLTLESS LINING AND SUPPORT STRUCTURE FOR UNDERGROUND OPENINGS
Samuel Taradash, Liberty Township, Trumbull County, and Nicholas Chlumecky, Portland, Ohio, assignors to Commercial Shearing & Stamping Company
Filed Jan. 22, 1970, Ser. No. 5,046
Int. Cl. E21d *11/00*
U.S. Cl. 61—45 R 4 Claims

A boltless interlocking lining and support structure for underground openings is provided made up of a plurality of segments of generally quadrilateral shape having end edges and side edges, the end edges of one such segment abutting the end edges of the next adjacent segments in generally circumferential relationship, and the side edges being provided with at least one indentation bounded by an outwardly extending lug at each end,



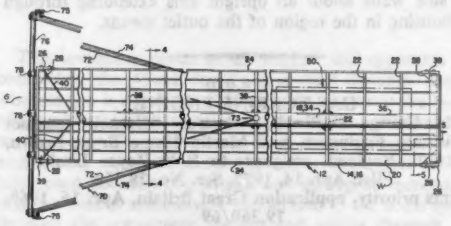
said lugs of one segment interfitting within the indentation of an adjacent side-by-side segment.

3,620,026
PILE DRIVING METHOD AND APPARATUS
J T. Mallard, 10203 Chadwick, Houston, Tex. 77029
Filed Nov. 17, 1969, Ser. No. 877,362
Int. Cl. E02d *7/18, 7/20*
U.S. Cl. 61—46.5 5 Claims



A pile driving method and apparatus wherein a baffle is provided in a pipe or other hollow pile, and a pressure differential is created across the baffle to move or vibrate the pile for either driving the pile into the ground or removing it from the ground.

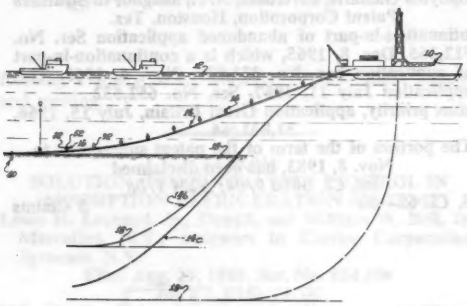
3,620,027
DOCK STRUCTURE
Edwin A. Nordell, Lyndhurst, Ohio, assignor to The Metal Craft Company, Chardon, Ohio
Filed Apr. 15, 1968, Ser. No. 721,386
Int. Cl. E02b *3/06*; E04b *5/02*; B63b *35/58*
U.S. Cl. 61—48 7 Claims



A dock structure wherein a dock member, forming a component of a dock, has a deck portion formed of inter-

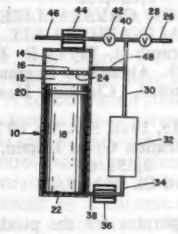
locking thin members rigidly connected together, is constructed to resist distortion and torsional twist, and is adapted to be anchored either rigidly at one end to shore or so as to rise and fall with the water level floating it.

3,620,028
PIPE LAY DOWN APPARATUS
Arthur E. Wilde, Garden Grove, Calif., assignor to Western Offshore Drilling & Exploration Company, Los Angeles, Calif.
Filed May 5, 1969, Ser. No. 821,765
Int. Cl. F16l 1/00
U.S. Cl. 61—72.3 2 Claims



A method and apparatus for laying subsea pipelines comprising the steps of attaching buoyant bodies, constructed in accordance with the present invention, at calculated predetermined distances along the pipeline to be laid; lowering the length of pipe with the bodies attached so that the curvature of the pipeline as it leaves the surface vessel, does not exceed a calculated angle; attaching the pipeline to the ocean floor; and causing the buoyant bodies of the present invention to be released and recovered. The buoyant body is of a hollow configuration with self-contained means for releasing the buoyant body from the pipe when the pipe reaches a substantially horizontal position on the subsea floor.

3,620,029
REFRIGERATION METHOD AND APPARATUS
Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals Inc., Allentown, Pa.
Filed Oct. 20, 1969, Ser. No. 867,594
Int. Cl. F25b 9/00
U.S. Cl. 62—6 13 Claims

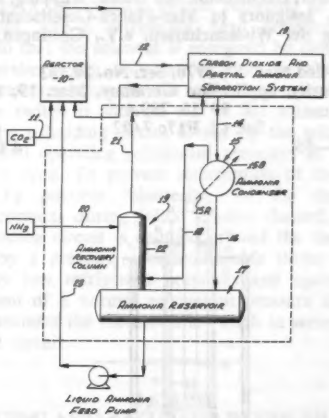


There is provided a device for cooling refrigeration fluid by expansion, comprising a displacer within a closed housing, said housing communicating through an orifice to another closed chamber so that the displacer can force a fluid through the orifice thereby doing work in the refrigeration cycle and conversely, the fluid can return through the orifice to move the displacer in the opposite direction at the proper time in the cycle. The invention is characterized in that the refrigeration is accomplished in a simplified manner without auxiliary equipment such as connecting rods, crank shafts, or the like to cycle the displacer. Also disclosed is the method of producing refrigeration by directly dissipating the expander work to heat by cycling a fluid through an orifice. Cycling of the fluid through the orifice is also the operative means of actuating the displacer.

3,620,030
METHOD OF PURIFYING VINYL FLUORIDE CONTAMINATED WITH IMPURITIES BY DISTILLATION IN THE PRESENCE OF CARBON DIOXIDE OR TRIFLUOROMETHANE
Yuichi Iikubo, Takuji Nishida, and Yoshiki Furukawa, Onoda, Japan, assignors to Onoda Cement Company, Limited, Yamaguchi, Japan
Filed Jan. 10, 1969, Ser. No. 790,416
Claims priority, application Japan, Jan. 12, 1968, 43/1,322
Int. Cl. F25j 3/08
U.S. Cl. 62—11 7 Claims

Vinyl fluoride containing impurities such as acetylene and hydrogen fluoride is purified by distilling the gaseous mixture of vinyl fluoride and such impurities in the presence of a carbon dioxide gas or trifluoromethane.

3,620,031
UREA PLANT AMMONIUM RECOVERY SYSTEM
Robert N. Tennyson, Anaheim, Calif., assignor to The Fluor Corporation, Ltd., Los Angeles, Calif.
Filed June 18, 1968, Ser. No. 737,987
Int. Cl. F25j 1/00, 3/06, 3/08
U.S. Cl. 62—17 9 Claims

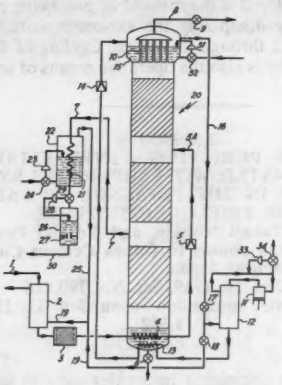


The invention is directed to a process for the recovery of ammonia from mixed ammonia and inert gaseous effluents from urea synthesis plants, by passage of such effluent through a first cooling zone to partially condense the ammonia, and then through a second cooling zone where most advantageously, the effluent from the first cooling zone is directly contacted with liquid ammonia to further deplete the inert gas of its ammonia content, liquid ammonia from both cooling zones being recovered and utilized as ammonia feed to the synthesis plant.

3,620,032
METHOD FOR PRODUCING HIGH-PURITY OXYGEN FROM COMMERCIALLY PURE OXYGEN FEED-STREAM

Guy Simonet, Paris, France, assignor to L'Air Liquide Société Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude

Filed May 16, 1968, Ser. No. 729,587
Int. Cl. F25j *3/02, 3/08*
U.S. Cl. 62—28 1 Claim

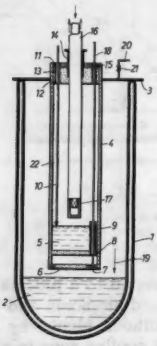


A method for producing high-purity oxygen in the liquid state through rectifying medium-purity oxygen, in which medium-purity oxygen is subjected to rectification in a column from which oxygen gas is bled below the feed, but well above the sump, the said gas being then liquefied, preferably in a constant-level liquid-nitrogen bath condenser, then withdrawn through a vessel with a flow regulator.

3,620,033
CRYOSTAT DEVICE

Albrecht Elsner, Hechtsheim, and Gustav Klipping, Berlin, Germany, assignors to Max-Planck-Gesellschaft Zur Forderung der Wissenschaften, e.V., Gottingen, Germany

Filed Mar. 17, 1970, Ser. No. 20,163
Claims priority, application Germany, Mar. 19, 1969, P 19 13 789.4
Int. Cl. F17c *7/02*
U.S. Cl. 62—55 4 Claims

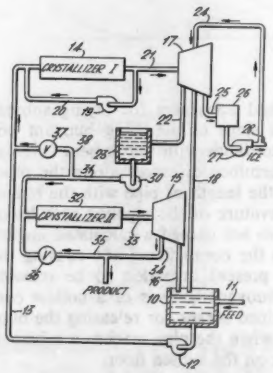


In a cryostat having a helium replenishing bath separated from a helium working bath by a first filter element made of a material which is at least partially impermeable to gaseous helium and helium I, as well as to any helium II having a temperature higher than that of the working bath, a second filter element of such material supported in the replenishing bath container spaced from and above the first filter element. The second filter element forms the normal floor of the replenishing bath. A space between the first and second filter elements is in communication with the replenishing bath container portion above the replenishing bath, whereby there is substantially no pressure difference across the second filter element so that the possibility of pressure-caused breakthrough of the replenishing helium into the working bath is eliminated.

3,620,034
MULTI-STAGE FREEZE CONCENTRATION OF COFFEE

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Patent Corporation, Houston, Tex.

Continuation-in-part of abandoned application Ser. No. 512,365, Dec. 8, 1965, which is a continuation-in-part of application Ser. No. 321,020, Nov. 4, 1963. This application July 11, 1967, Ser. No. 652,532
Claims priority, application Great Britain, July 15, 1966, 31,831/66
The portion of the term of the patent subsequent to Nov. 8, 1983, has been disclaimed
Int. Cl. B01d *9/04;* A23f *1/08*
U.S. Cl. 62—58 5 Claims



In a staged freeze concentration process for concentrating coffee solution, ice crystals are removed from the system after the first stage from less concentrated coffee solution. Ice crystals removed from the more concentrated coffee solution in the second stage are added to incoming feed. Coffee solution from which ice crystals are separated in the second stage is removed from the system as a product.

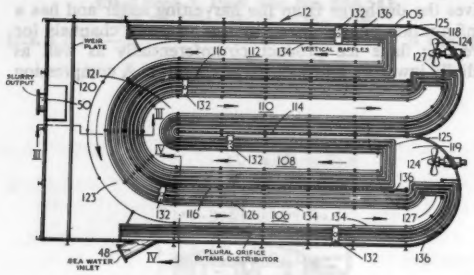
3,620,035
HELICAL FLOW CRYSTALLIZER IN A DESALINATION UNIT

Allan Martindale, Bramhall, Bryan R. Parr, Sale, and Michael J. S. Smith, Abingdon, England, assignors to Simon-Carves Limited, Cheadle Heath, Stockport, Cheshire, England

Filed Jan. 15, 1968, Ser. No. 697,762
Claims priority, application Great Britain, Jan. 17, 1967, 2,351/67
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 15 Claims

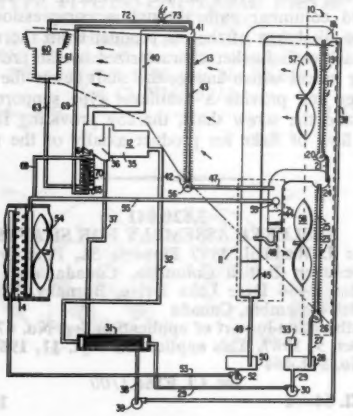
A method and apparatus for the production of fresh water from saline water wherein the saline water passes along an extended path during which a volatile liquid refrigerant is injected into the water on one side of the container only and causing boiling of the refrigerant which

creates a turbulent flow about the baffles thus defining a helical flow path for the saline water, the saline water



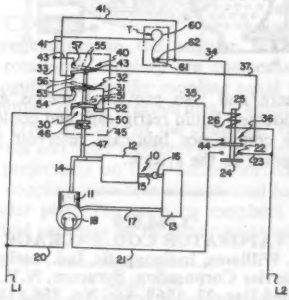
forming a slurry of ice crystals for subsequent removal and melting.

3,620,036
SOLUTION CONCENTRATION CONTROL IN ABSORPTION REFRIGERATION SYSTEMS
Louis H. Leonard, Jr., Dewitt, and William W. Bell, Jr., Marcellus, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,206
Int. Cl. F25b *15/06*
U.S. Cl. 62—101 **16 Claims**



An absorption refrigeration system having a concentration control tank connected to receive refrigerant from a concentration control condenser which condenses vapor formed in the generator. A cooling medium is passed first over the absorber, then over the condenser, and finally over the concentration control tank to provide a control pressure therein. A concentration control passage, including a depending loop, extends between a region of the system which is at refrigerant condenser pressure into the concentration control tank. The difference in pressure between the concentration control tank and the refrigerant condenser is balanced by a column of liquid extending into the concentration control tank. When the cooling medium temperature drops, the difference in pressure between the concentration control tank and the refrigerant condenser is reduced, which causes refrigerant to be discharged from the concentration control tank into the strong absorbent solution. Conversely, when the cooling medium temperature rises, the difference in pressure between the concentration control tank and the refrigerant condenser increases causing the refrigerant, which is condensed in the concentration control condenser, to be stored in the concentration control tank. A vent passage is provided with a valve therein for rapidly discharging the contents of the concentration control tank into the strong solution circuit to protect against solidification in the event of an electrical power failure.

3,620,037
COMPRESSOR RESET DELAY CIRCUIT
Clyde L. Young, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio
Filed July 2, 1970, Ser. No. 51,931
Int. Cl. F25b *41/00*
U.S. Cl. 62—158 **6 Claims**

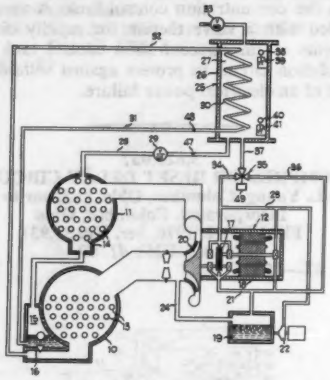


An electric motor driven refrigerating system for air conditioning a room or the like is controlled by a solenoid operated contactor. The solenoid circuit is controlled by a thermostatic switch, subjected to the air of the room, and a refrigerant head pressure operated switch so that the solenoid is energized by closing of the thermostatic switch only in the event a relatively low head pressure exists in the refrigerating system. The pressure switch is shunted out of the solenoid control circuit by a holding circuit closed by the solenoid during normal operating refrigerant pressures at which the switch is open. To prevent interruption of the solenoid circuit by possible "chattering" of the thermostatic switch contacts during initial closure thereof, the solenoid holding circuit is shunted around the thermostatic switch by a pressure operated double throw switch at relatively low refrigerant pressures and operates upon attainment of a normal refrigerant pressure in the system to connect the thermostatic switch in series with the solenoid circuit.

3,620,038
PURGING APPARATUS FOR REFRIGERATION SYSTEM
Paul W. Muench, Medford Lakes, N.J., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed June 17, 1970, Ser. No. 47,059
Int. Cl. F25b *43/04*
U.S. Cl. 62—195 **10 Claims**

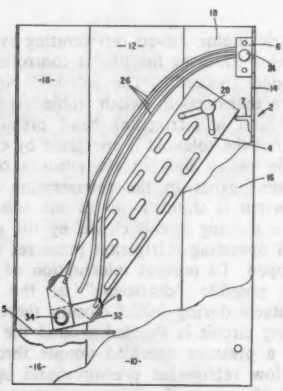
An apparatus for purging non-condensible gases from a refrigeration system and having a chamber receiving a mixture of condensible refrigerant vapor and non-condensible gases from the condenser of the system, a cooling coil in the chamber and using refrigerant from the system to condense the refrigerant vapor, and a com-

pressor lubricant pump connected to the chamber and supplying oil under pressure to the chamber and providing a liquid piston effective to force the non-condensible gases from the chamber through a relief valve to



the atmosphere and also providing means effective to draw the condensed liquid refrigerant and cooled oil mixture into the compressor lubricant reservoir and return of the refrigerant to the system.

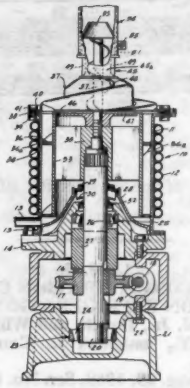
3,620,039
EVAPORATOR COIL PACKAGE
John A. Williams, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 22, 1969, Ser. No. 886,811
Int. Cl. F25d *21/14*
U.S. Cl. 62—285 **6 Claims**



An evaporator coil package for use in an air conditioning system. The width of the evaporator coil plenum enclosure may be varied for engagement with duct or air handling device used in conjunction with the evaporator coil package.

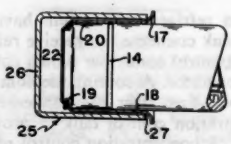
3,620,040
COMBINATION ICE AUGER AND ICE PRESS
Jack F. Clearman, Stevensville, Mich., and Leonard W. Ohlsson, St. Paul, and Robert H. Sitko, Stillwater, Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Oct. 17, 1969, Ser. No. 867,223
Int. Cl. F25c *1/14*
U.S. Cl. 62—354 **27 Claims**

An ice maker machine employing a refrigerated chamber and a harvesting auger positioned with its flights in scraping relation to the inner wall of the refrigerated chamber to continuously scrape ice particles from the wall thereof, and being provided with a vertical shaft for supporting the harvesting auger. A collecting chamber receives the discharge from the harvesting auger and has a configuration characterized by one or more channels for directing flake ice product cirumferentially as well as radially inwardly into a disharge chamber. A compression



auger in the form of a screw shaft co-rotatable with the harvesting auger drives the ice product in the form of a confined columnar path through a compression device prior to discharge of the ice product from the machine. The machine is further characterized by the provision of bearing means which engage the shaft below the freezing chamber and provide a cantilever type support for the auger and the screw shaft, thereby providing for unimpeded flow of flake ice product axially of the machine.

3,620,041
RESLEEVE ASSEMBLY FOR SHAFTS
Raynor J. Waddell, 2987 Pinnacle St., Port Coquitlam, Vancouver, British Columbia, Canada, and Karl W. Eggler, 6466 Deer Lake Drive, Burnaby, Vancouver, British Columbia, Canada
Continuation-in-part of application Ser. No. 673,832, Oct. 9, 1967. This application Sept. 11, 1969, Ser. No. 871,444
Int. Cl. F16c *1/00*
U.S. Cl. 64—1 **16 Claims**

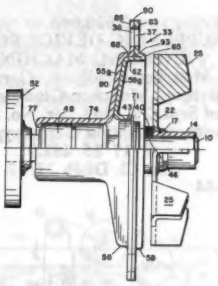


A thin walled metallic sleeve provided with an exterior flange at one end to which a tool may be applied for drawing the sleeve over an end portion of the shaft to be resleeved, the sleeve having interior shaft engaging means at its other end for engaging the end of the shaft and preventing movement of the sleeve therealong, the sleeve very slightly smaller in diameter than the end portion of the shaft so that it does not rotate thereon.

3,620,042
SHEET METAL WATER PUMP

Robert J. Gray, Fairfield, Ill., assignor to Airtex Products Div., United Industrial Syndicate, New York, N.Y.

Filed Sept. 2, 1969, Ser. No. 854,541
Int. Cl. F04d *29/00*; F16c *1/06*
U.S. Cl. 64—3 6 Claims

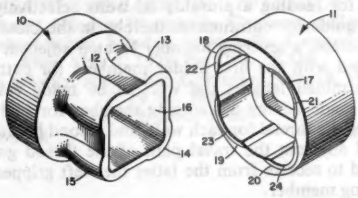


A water pump for automobiles is manufactured with a sheet metal body and impeller. The construction is highly economical by virtue of the use of stampings wherein the pump has a double thickness non-breakable structure.

3,620,043
SPLINE-TYPE PIVOTS, UNIVERSAL JOINTS AND FLEXIBLE COUPLINGS

Gottfried K. Gantschnigg, Crownsville, Md., assignor to ARINC Research Corporation, Annapolis, Md.

Filed May 12, 1970, Ser. No. 36,515
Int. Cl. F16d *3/18*
U.S. Cl. 64—9 R 11 Claims

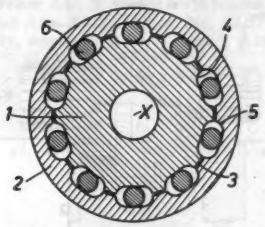


A universal joint and the like which obviates the need for the conventional double-pivot, three member arrangement by providing a plurality of equally spaced bearing surfaces on each of a pair of cooperating members. One of the members is the shaft or male portion and is provided with a plurality of substantially circular shaped and profiled segments integrally formed thereon. The other member is the housing or female portion and has a like number of recessed surfaces formed with an arcuate configuration. The shape of this arcuate configuration may be varied according to the intended use. For example, it may be circular with a radius equal to that of the circular profiled segments, if only small relative movement is desired, or of larger radius if a large amount of relative movement is desired. It may also be cylindrical if it is desirable to have movement such as that obtained with a splined shaft. The surface of the arcuate configuration is also provided with a bushing for protection against wear and for self-lubrication such as a Teflon insert.

3,620,044
POWER TRANSMITTING SYSTEM

Claude Latour, Garches, France, assignor to Société a Responsabilite Limitee Société d'Etudes et de Developpement Industriel Proclem, Levallois-Perret, France

Filed Jan. 22, 1970, Ser. No. 4,992
Claims priority, application France, Jan. 31, 1969, 6902194
Int. Cl. F16d *3/64*
U.S. Cl. 64—14 7 Claims

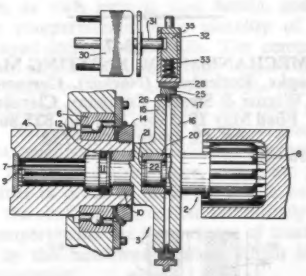


Cyclic irregularities in the angular velocity of the drive to a rotational coupling are compensated for by providing angular play in the coupling equal to the peak to peak amplitude of the irregularities in angular displacement of the drive member of the coupling. The coupling comprises inner and outer members having complementary recesses or projections on their facing surfaces, forming housing for coupling members dimensioned to permit the desired angular play. The coupling members are preferably cylindrical and may be of elastic material.

3,620,045
SHAFT DISCONNECT-NONSHEAR TYPE

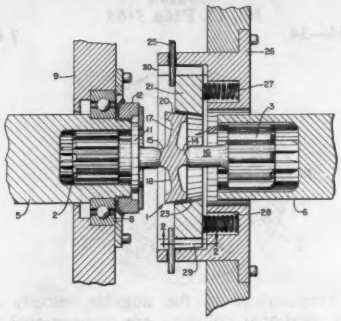
John L. Butterfield, Erie, Pa., assignor to General Electric Company

Filed July 2, 1970, Ser. No. 51,980
Int. Cl. F16d *3/00*
U.S. Cl. 64—28 6 Claims



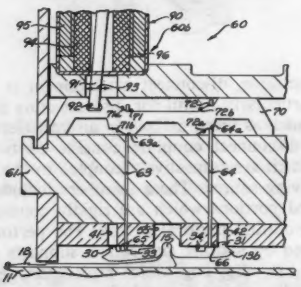
A nonresettable, disconnect arrangement is described which is particularly useful for disconnecting high speed generators such as those utilized in aircraft electrical systems. The disconnect coupling consists of two splined members which are respectively coupled to the generator and the driving source. These members include two circular flanged portions which are rigidly connected by a torque transmitting perforated ring. The perforated ring is surrounded by another ring which supports a number of inwardly extending cogs which project through the perforations in the torque transmitting line. A pair of disc brakes are selectively actuated to engage the cog carrying ring when disconnect is desired. When the brakes engage the ring, the ring and the cogs are held in a fixed position while the flange members and the perforated ring continue to rotate. The cogs act like teeth or shearing members and cut away the remaining metal between the perforations, severing the ring and disconnecting the generator from the driving source.

3,620,046
GENERATOR SHAFT DISCONNECT
James L. Wenzel, Northeast, and Lawrence Arthur Clark, Erie, Pa., assignors to General Electric Company
Filed July 2, 1970, Ser. No. 51,981
Int. Cl. F16d *3/00*
U.S. Cl. 64—28 **6 Claims**



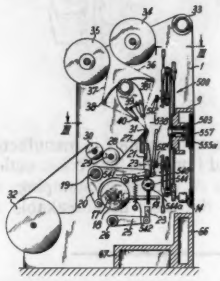
A non-resettable disconnect arrangement is described which is particularly useful for disconnecting high speed generators such as those utilized in aircraft electrical systems. A splined, disconnect coupling member is disposed between the driving and driven shafts. The shaft of the coupling contains at least one reduced diameter shear section which ruptures to disconnect the driving and driven shafts. A conical friction disc is mounted on the shaft of the disconnect coupling. An externally controlled friction ring having a corresponding inner conical surface is brought into contact with the disc during disconnect and the torque exerted on the shaft when the disc and ring engage ruptures the shear sections and disconnects the generator.

3,620,047
DIAL MECHANISM FOR KNITTING MACHINE
Horst Paepke, Rottenburg (Neckar), Germany, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed May 19, 1969, Ser. No. 825,867
Int. Cl. D04b *9/06, 9/38*
U.S. Cl. 66—25 **4 Claims**



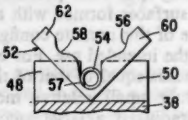
A dial mechanism for a knitting machine comprises a dial member rotatable through a plurality of knitting stations. Knitting needles are carried by the dial member. Each of the knitting needles has a needle-moving jack associated therewith. Certain of the needle-moving jacks are long butt jacks and certain of the other needle-moving jacks are short butt jacks. Cam means are located at each knitting station and define a knitting cam track and a welting cam track, respectively, into which butts on the needle-moving jacks move, depending upon the position of the needle-moving jacks as they move through each station. An electromagnetic selector mechanism is provided at each station for varying the position of the needle-moving jacks relative to their associated needle to control the operation of the needles in the station.

3,620,048
WEFT SUPPLYING DEVICE FOR A WARP KNITTING MACHINE
Stefan Furst, Monchen-Gladbach, Germany, assignor to Walter Reiners, Monchen-Gladbach, Germany
Filed Sept. 26, 1969, Ser. No. 861,250
Claims priority, application Germany, Sept. 27, 1968, P 17 85 482.9
Int. Cl. D04b *23/12*
U.S. Cl. 66—84 **5 Claims**



Warp knitting machine having a zone wherein needles are disposed and means for supplying warp threads to the needles including a device for filling a weft having first holder members for making the weft ready outside the needle zone, means for guiding the weft to the warp threads, the first holder members having a thread guide cooperating therewith, for making the weft ready, the thread guide being displaceable in a closed travel path, means for feeding a plurality of wefts selectively to the thread guide for entrainment thereby in the closed travel path thereof, a severing member located adjacent and coordinated with the first holder members for cutting into predetermined lengths the weft to be made ready, the thread guide having a clamping member for individually gripping the thread for each weft, and second holder means located adjacent the travel path of the thread guide and adapted to receive from the latter the weft gripped by the clamping member.

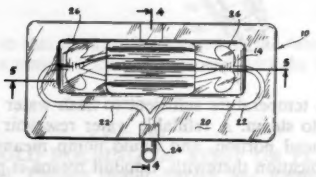
3,620,049
STRIPING BOX FOR CIRCULAR KNITTING MACHINES WITH ADJUSTABLE FINGER-ACTUATING JACKS
Lester Mishcon, Miami Beach, and Donald W. Reagan, Hialeah, Fla., assignors to The Singer Company, New York, N.Y.
Filed Apr. 9, 1970, Ser. No. 27,014
Int. Cl. D04b *15/58, 15/80*
U.S. Cl. 66—138 **1 Claim**



Finger-actuating L-shaped jacks for the toothed drum of a striping box are each recessed to receive a spring mounted in an annular groove of the drum such that a

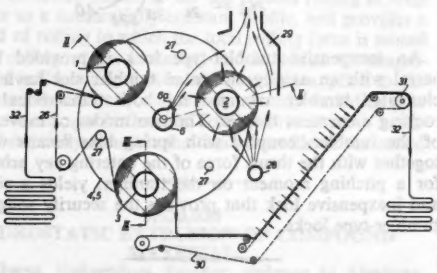
jack may be pivoted about the spring to cause one leg to project from the drum teeth on one side of the spring or the other leg from the drum teeth on the other side of the spring, and such that a jack may be moved under the spring and disposed to relocate a projecting leg in a new position on the one side or the other of the spring.

3,620,050
FLUIDIC WASHING MACHINE
Paul J. Glasgow, Woodmere, N.Y., assignor to Glasgow Products, Inc., Woodmere, N.Y.
Original application Feb. 25, 1969, Ser. No. 801,991. Divided and this application Apr. 27, 1970, Ser. No. 43,272
Int. Cl. B05c *3/05*; D06f *19/00*
U.S. Cl. 68—355 **4 Claims**



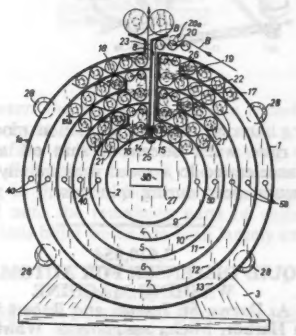
A machine for washing objects, utilizing the vibratory and oscillatory effects of fluidic oscillators including a container for articles to be washed, a plurality of fluid discharge outlets directly inwardly of the container and at least one fluidic oscillator in communication with the discharge outlets to provide pulsation of the fluid discharged into the container.

3,620,051
TEXTILE DECATISING APPARATUS
Dieter Riedel, Minden, Westphalia, Germany, assignor to Drabert Sohne, Minden, Westphalia, Germany
Filed May 7, 1970, Ser. No. 35,336
Claims priority, application Germany, Nov. 10, 1969, P 19 56 399.6
Int. Cl. D06c *1/00*
Int. Cl. 68—8 **6 Claims**



Textile decatising apparatus comprising three perforated cylinders rotatably mounted in supporting discs. The cylinders are symmetrically arranged around the axis of the discs which are rotatable to locate each cylinder sequentially at first, second and third process stations. At the first station, the cylinder is wound with material to be decatised, at the second station, the material wound on the cylinder is decatised by steam passed through the cylinder, and at the third station the decatised material is unwound from the cylinder.

3,620,052
CONTAINER FOR THE CONTINUOUS TREATMENT OF WEB- OR STRAND-LIKE TEXTILE MATERIAL WITH A TREATMENT MEDIUM
Peter Schroeder, Arni, Switzerland, assignor to Paul Weber AG, Rothrist, Switzerland
Filed Aug. 10, 1970, Ser. No. 62,572
Claims priority, application Switzerland, Aug. 15, 1969, 12,407/69
Int. Cl. B05c *3/132*
U.S. Cl. 68—9 **18 Claims**

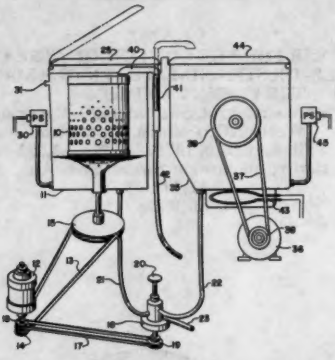


A container for the continuous treatment of web- or strand-like textile material with a treatment medium is disclosed. The container is of substantially "annular" configuration, as such term is used herein, and is subdivided into compartments by a plurality of concentrically arranged intermediate walls. The compartments are divided at their highest point into sectors by means of a radial chute or shaft which extends through the container and communicates with the innermost compartment. Each compartment opens at the region of the shaft into its neighboring compartment alternatingly to each side of the shaft. Furthermore, means are provided in the container in order to guide the textile web or the like through the shaft and thereafter successively through all of the compartments for the purpose of treating such textile web by the treatment medium which is located in each compartment.

3,620,053
SPIN DRYERS
Harold George Dunn, Ruislip, England, assignor to The Hoover Company, North Canton, Ohio
Filed Aug. 4, 1969, Ser. No. 847,304
Claims priority, application Great Britain, Aug. 15, 1968, 39,028/68
Int. Cl. D06f *29/00, 39/08*
U.S. Cl. 68—23.5 **2 Claims**

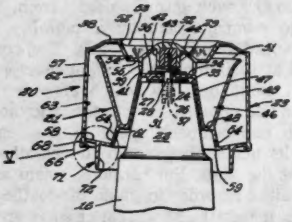
A spin extraction machine for spin rinsing, and spin extraction of water from, a clothes load to be used in conjunction with a clothes washer and having both spin rinsing and spin extraction modes of operation. The spin extraction machine comprising a rotatable perforate spin basket rotatably mounted about its axis within a stationary outer container. During spin rinse the spin basket is preferably intermittently rotated for a plurality of rinse

cycles while a continuous stream of rinse water is directed toward the interior of the spin basket. The maximum rotational speed of the spin basket during a rinse cycle is that corresponding to a radial acceleration of less



than 300 *g*. During the spin extraction mode of operation, the rinse water stream is shut off and the spin basket is accelerated to a speed substantially higher than the maximum speed during spin rinse.

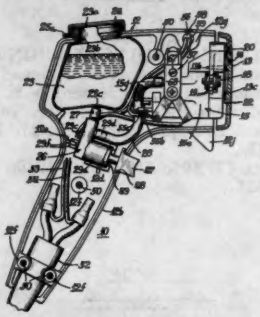
3,620,054
LIQUID DISPENSER FOR AUTOMATIC WASHING MACHINE
Reinhold A. Drews, St. Joseph, and Robert S. Trembath, Benton Harbor, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Feb. 26, 1969, Ser. No. 802,451
Int. Cl. D06f *39/02*
U.S. Cl. 68—17 A **6 Claims**



A two part centrifugal dispenser for mounting on an agitator of a laundry machine for discharging liquid into the machine. The parts are attached removably to the agitator in nested relationship and are easily assembled without the use of special fasteners or adhesives. One of the parts has a lip seal which tightly engages a peripheral flange on the other member or part. A downwardly extending, annular wall surface or guard flange is formed outwardly of discharge outlet apertures to prevent liquid spillage.

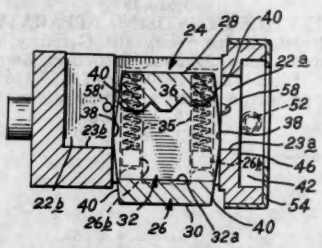
3,620,055
PORTABLE STEAMER
Donald L. Blachly, Glendale, and Richard A. Smith, Milwaukee, Wis., assignors to John Oster Manufacturing Co., Milwaukee, Wis.
Filed May 20, 1970, Ser. No. 38,972
Int. Cl. A47j *51/00*; D06c *1/00*
U.S. Cl. 68—222 **13 Claims**

A portable, hand-held steamer comprising a casing with a head portion and a depending handle. A metal plate forms a front closure wall of the casing head portion and is provided with steam discharge ports therein for directing a flow of steam onto a garment. A flash type steam generating chamber is mounted in the head portion of the casing for converting water to steam and directing the steam out through steam discharge ports. Thermostatically controlled electric heating means is provided for maintaining wall surfaces of the steam generating cham-



ber at a temperature sufficient to flash water striking the same into steam. A refillable water reservoir is provided in the head portion, and liquid pump means is in fluid communication therewith. Conduit means is provided for delivering liquid to the flash chamber, and the pump includes an actuator projecting outwardly of the handle for hand manipulation to pump water from the reservoir into the steam generating chamber.

3,620,056
LOCKING CYCLINDER
John F. Weber, Jr., Chicago, Ill., assignor to E. Edelmann & Co.
Filed Feb. 25, 1970, Ser. No. 13,996
Int. Cl. E05b *15/14, 29/02*
U.S. Cl. 70—362 **6 Claims**



An inexpensive tumbler-type lock is provided by a barrel with an axially elongated tumbler slot having an elongated tumbler arranged for both translational and rocking movement therein. The two modes of movement of the tumbler, coupled with spring bias means which together with the thrust force of the entering key provides for a pitching moment on the tumbler, yields a simple and inexpensive lock that provides the security sought in tumbler-type locks.

3,620,057
KEY TAG
Harold Holland, Cranston, R.I., assignor to Republic Corporation, Los Angeles, Calif.
Filed Nov. 24, 1969, Ser. No. 879,275
Int. Cl. A47g *29/10*
U.S. Cl. 70—456 R **5 Claims**

A key tag including a holder molded in a one-piece construction having outwardly extending tongues formed as an integral part thereof, each of the tongues including a

free end that is foldable for connection to the holder and having a key ring mounted thereon, at least one of the tongues having the free end thereof releasably connected

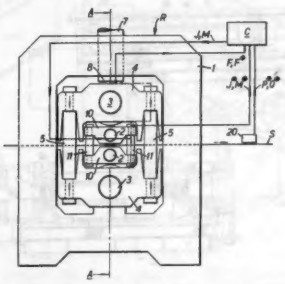
to the holder so that the key ring located on the releasable tongue may be removed from engagement with the holder as desired.

3,620,058

HOT OR COLD ROLLING OF STRIP OR PLATE

Bruno Sabatini, Thames Ditton, Surrey, and Kenneth A. Yeomans, Worksop, England, assignors to The British Iron and Steel Research Association

Filed July 7, 1969, Ser. No. 839,506
Claims priority, application Great Britain, July 9, 1968, 32,756/68
Int. Cl. B21b *37/12*
U.S. Cl. 72—8 3 Claims



This invention relates to the hot or cold rolling of strip or plate to a substantially constant profile, and provides a method of rolling in which the total rolling force is sensed during rolling of the material, and in which the magnitudes of roll-bending forces and moments applied to the rolls are independently and simultaneously varied in proportion to changes in the total rolling force so as to maintain substantially constant the desired profile of the rolled material.

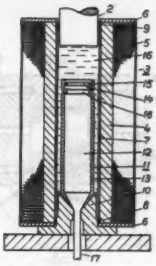
3,620,059

HYDROSTATIC EXTRUSION OF COMPOUND MATERIAL

Jan Nilsson, Robertsfors, Sweden, assignor to Almänna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 9, 1968, Ser. No. 758,308
Claims priority, application Sweden, Mar. 15, 1968, 3,513/68
Int. Cl. B21c *23/22*
U.S. Cl. 72—60 17 Claims

In hydrostatic extrusion of a wire or rod constituted by a casing of one material and a core of another, usually a softer material, a billet is extruded through a die from a pressure chamber provided with a conical surface, adjacent the die opening. The billet is so constructed that the axial forces created by the differences in molding resistance of the different materials are transferred between the casing and the core. This is done by pressing the rear end of the casing into a groove in the core.



The joint between the casing and core is sealed at the rear ends. The front end of the core is shaped to match the conical surface of the die, and the casing may be brought down over this front end, the front end of the casing tapering in thickness. Successive casing and cores may be joined onto the remaining parts of casings and cores of a previous billet which has been largely extruded.

3,620,060

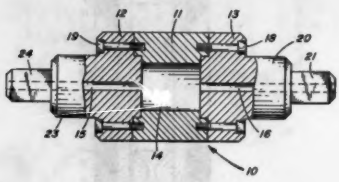
APPARATUS FOR FORMING CLOSING HEADS AT RIVETS

Paul Ramseier, Pfaffikon, Switzerland, assignor to Bracker AG, Pfaffikon, Switzerland

Filed Apr. 3, 1970, Ser. No. 25,513
Claims priority, application Switzerland, Apr. 11, 1969, 5,501/69
Int. Cl. B21d *1/02*
U.S. Cl. 72—112 9 Claims

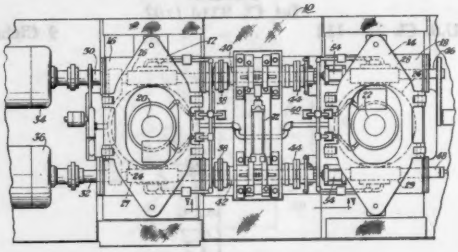
There is disclosed an apparatus for forming closing heads at rivets with the aid of a rivet set or anvil which carries out loop-like revolving movements. According to the invention, the rivet set is supported in a crank-like element which cooperates with a drive shaft, the axis of rotation of said crank-like element being inclined with respect to the axis of rotation of the drive shaft. Further, the crank axis of the crank-like element in one extreme position as least approximately coincides with the axis of the drive shaft and in the other extreme position such crank axis intersects the axis of the drive shaft at the region of the rivet.

3,620,061
DESIGN OF ULTRASONIC TRANSDUCERS FOR USE WITH ROLLING MILL ROLLS
James W. Cunningham, Vandergrift, and George R. Douglas, Pittsburgh, Pa., assignors to the United States of America as represented by the Secretary of the Navy
Filed Oct. 3, 1969, Ser. No. 863,480
Int. Cl. B21b 27/00
U.S. Cl. 72—199 **3 Claims**



A hollowed out roller from a rolling mill with an ultrasonic transducer placed within the opening. The transducer is a circular electromagnetic or a piezoelectric type which creates vibrations that radiate outward from the center of the roller. To withstand excessive vibrational forces, the ultrasonic transducer is either babbit jointed or epoxied into position within the roller.

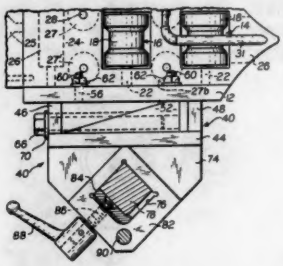
3,620,062
MILL UNJAMMING DEVICE
John L. Prokell, Bentleyville, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.
Filed May 16, 1969, Ser. No. 825,318
Int. Cl. B21b 31/24
U.S. Cl. 72—248 **17 Claims**



I disclose an unjamming mechanism for rolling mill screwdown means and the like, said mechanism comprising a pair of oppositely rotatable shafts coupled to said screwdown means, shaft displacing means mounted upon each of said shafts for imparting equal and opposite angular displacements thereto, and motive means coupled between said shaft displacing means for actuating said displacing means in opposite directions.

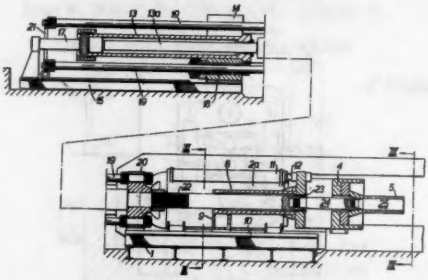
3,620,063
MICRO-ADJUSTING GUIDE
William Kursinczky, Woodbridge, N.J., assignor to General Cable Corporation, New York, N.Y.
Filed May 19, 1969, Ser. No. 825,866
Int. Cl. B21b 39/20
U.S. Cl. 72—250 **12 Claims**

Roll passes for rolling rods or other work pieces are supported by a platform having micro-adjusting means to shift the platform selectively in vertical and horizontal directions to obtain perfect positioning with respect to a rest bar of a hot rolling mill. A substitute rest bar pro-



vides a guide for the horizontal adjustment, and there is a clamp for crude adjustment and cam means (screw) for the micro-adjustment.

3,620,064
EXTRUSION PRESSES
Ronald John Elger, Parkstone, Dorset, and Ian Lewis Cameron, Blandford, Dorset, England, assignors to Fielding Plant Design Limited, Bournemouth, Hampshire, England
Filed July 2, 1969, Ser. No. 838,568
Claims priority, application Great Britain, July 5, 1968, 32,267/68
Int. Cl. B21c 27/00
U.S. Cl. 72—272 **18 Claims**

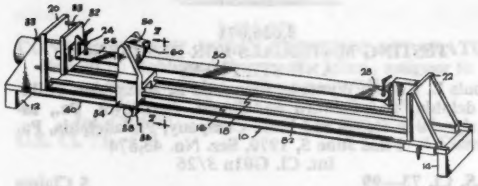


An extrusion press having two or more main cylinders in which the free space between the cylinders is used to accommodate guide means for the moving crosshead. Individual supporting means are provided for each cylinder through which the weight of that cylinder is independently transmitted to the press-bed.

3,620,065
FOIL FORMING DEVICE
Wilford A. Swanson, 11609 Pendleton St., Sun Valley, Calif. 91352
Filed Dec. 20, 1968, Ser. No. 785,580
Int. Cl. B21d 11/02
U.S. Cl. 72—297 **10 Claims**

A machine and method is described for forming shapes in preferably elongated workpieces which are fixedly mounted between two end brackets on a bed. The machine includes a pair of arcuately shaped forming tools. One of the tools has a desired shape which mates with the shape of the other tool. The tools are mounted on either side of the material being formed and are rotated simultaneously as the carriage to which they are mounted

moves along the longitudinal axis of the workpiece. The arcuate radii of the forming tools are at a dimension considerably less than the over-all length of the workpiece and the movement of the carriage and the rotation



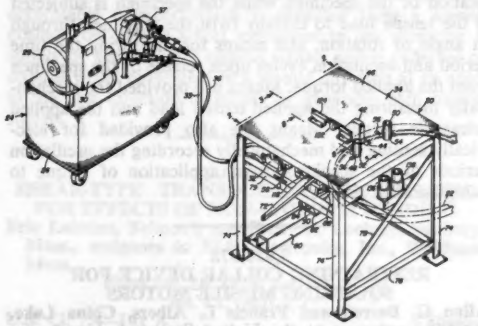
of the tools is so designed that a complete arcuate rotation of the tool is completed as the tool is moved along the entire length of the material, thus forming the desired shape.

3,620,066

METAL BENDING METHOD AND MACHINE THEREFOR

Neville T. Henkel, 9582 Labrador Lane, El Cajon, Calif. 92021, and Harry Wright, El Cajon, and Herman W. Scharer, Spring Valley, Calif.; said Wright and said Scharer assignors to said Henkel

Filed June 25, 1969, Ser. No. 836,531
Int. Cl. B21d *31/00*
U.S. Cl. 72—362 **6 Claims**



A method of bending metal which consists in applying pressure to the area where bending is to be effected, the force of the pressure having a value which approximates that at which the bending occurs, the method also including augmenting such pressure, preferably manual, to effect the ultimate degree of bending of the metal, such method being performed by a machine including a device for applying pressure, preferably a hydraulic device, and another device, preferably manually powered, for augmenting the force of the first mentioned device, but at a lesser pressure value.

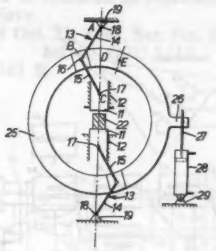
3,620,067

ARTICLE SHAPING OR FORMING MACHINES

Keith Ross, Sheffield, England, assignor to Davy and United Engineering Company Limited, Sheffield, England

Filed Sept. 17, 1969, Ser. No. 858,618
Claims priority, application Great Britain, Sept. 18, 1968, 44,376/68
Int. Cl. B21j *9/18*
U.S. Cl. 72—407 **3 Claims**

A machine for hot or cold forging of a workpiece or for compacting metal powder in a die into a solid workpiece has a support and at least one tool reciprocatable towards and away from the support, a first link is pivotally secured at one end to the tool and is pivotally jointed at the other end to one end of a second link, the second link being pivotally secured at its other end to anchor means which can be displaced towards and away from the support. The pivot joint is reciprocated through a posi-



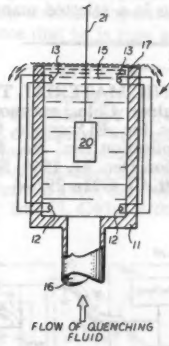
tion in which the links are in line between positions in which the links are inclined to one another. The pivot joint may be reciprocated by means of a double-acting fluid operated piston and cylinder device. A plurality of similar pivot joints may be operated simultaneously and in synchronism by connecting all the pivot joints to an annular ring which is reciprocated about its axis.

3,620,068

QUENCH CALORIMETER

Robert P. Cary, Chicago, and Philip E. Cary, Joliet, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 24, 1970, Ser. No. 13,556
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 R **8 Claims**



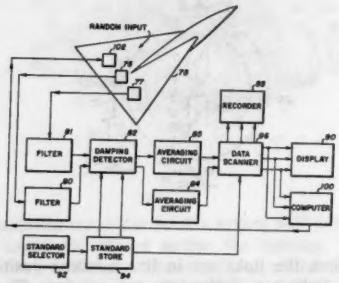
An instrument to measure and record the change in temperature of a quenching fluid during a quench cycle for a metal specimen. The instrument includes a quench tank filled with a quenching fluid into which the specimen is immersed and a plurality of thermocouples connected in series to form a thermopile which is connected to an electrical recorder. The quenching fluid is circulated into the tank at its bottom and out its top. The opposing junctions of the thermocouples are suitably located to be sensitive to the temperature of the inflowing and outflowing fluid, respectively.

3,620,069

METHOD AND APPARATUS FOR MEASURING THE DAMPING CHARACTERISTICS OF A STRUCTURE

Henry A. Cole, Jr., Los Altos, Calif., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 24, 1969, Ser. No. 793,771
Int. Cl. G01h 1/00; G01l 19/00
U.S. Cl. 73—67.2 10 Claims



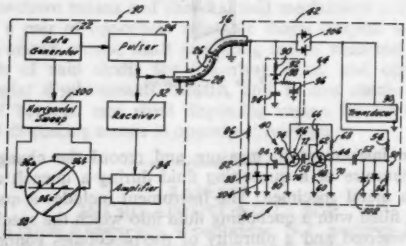
Apparatus for measuring the damping characteristics of a structure or system during excitation by random forces or influences. The "RANDOMDEC" apparatus is comprised of at least two parallel sampling circuits which perform time sequential sampling operations on predetermined portions of a given input signal. The corresponding outputs of each sampling circuit are then added together at a plurality of output terminals. From each output terminal a sampling transient indicative of a point on the damping characteristic of the structure can be obtained. In accordance with the invention, a system is also disclosed utilizing this apparatus to provide an on-the-line damping ratio and period detection and display apparatus including means for instantaneously observing the damping characteristics of the monitored structure and providing an output control signal which can be used to influence the characteristics of the structure or the forces applied thereto in a selected manner.

3,620,070

ULTRASONIC MATERIAL TESTER

Jack T. Collins, Boulder, Colo., assignor to Automation Industries, Inc., El Segundo, Calif.

Continuation of application Ser. No. 575,210, Aug. 3, 1966. This application Dec. 22, 1969, Ser. No. 883,677
Int. Cl. G01n 29/04
U.S. Cl. 73—67.8 16 Claims



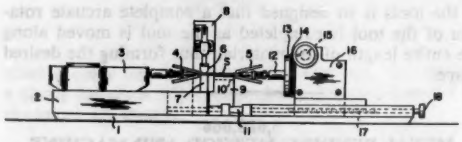
An ultrasonic tester having a pulser and receiver connected to a search unit with a transducer through a coaxial cable. A preamplifier, integral with the transducer in the search unit is provided to improve the signal to noise ratio of the returned echo signals. A power supply for the preamplifier is also provided integral with the search unit. The power supply is energized by the transmitted pulse, whereby a portion of the transmitted pulse is rectified and filtered to provide operating voltages to the preamplifier.

3,620,071

TESTING MATERIALS FOR RESILIENCE AND STIFFNESS

Louis E. Kelley, Wyncote, Raymond B. Alexander, Philadelphia, and Edward M. Sioma, Levittown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 5, 1970, Ser. No. 43,874
Int. Cl. G01n 3/26
U.S. Cl. 73—99 5 Claims



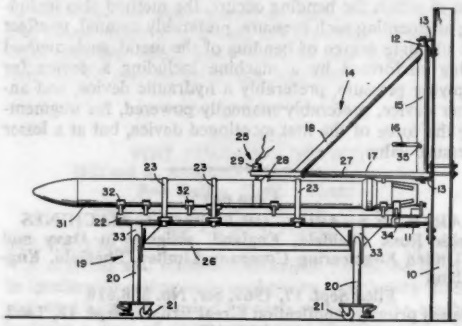
Resilience and stiffness of a fabric specimen are determined from measurements of the tensile load that induces a minimum oscillation in a fabric specimen and the time required for an initial complete oscillation cycle at the tensile load. An apparatus useful for making these measurements comprises means for subjecting the specimen to a longitudinal tensile load, means for holding an end of the specimen and means for applying a releasable torque to another end around the longitudinal axis of rotation of the specimen while the specimen is subjected to the tensile load to thereby twist the specimen through an angle of rotation, and means for measuring the time period and oscillation cycles upon release of the specimen from the applied torque. Means are provided for mechanically measuring the applied tensile load and the applied releasable torque. Means are also provided for electrically sensing and mechanically recording the oscillation periods of the specimen from application of torque to damping after release.

3,620,072

RESTRAINING COLLAR DEVICE FOR SQUIBBING MISSILE MOTORS

Allan G. Barrett and Francis L. Albers, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

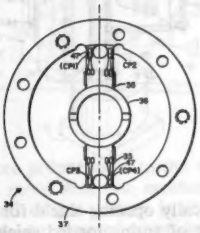
Filed Apr. 23, 1970, Ser. No. 31,332
Int. Cl. G01m 17/00
U.S. Cl. 73—117.4 2 Claims



A device for restraining missile motors for squibbing. It comprises an alignment fixture and a restraining collar assembly mounted to a back plate whereby when a missile

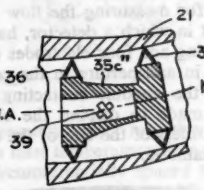
is moved into alignment the restraining collar assembly engages the missile hook or hanger on the outside of the motor casing thereby accurately positioning the missile so that current will flow. Only when accurately positioned will the missile motor be squibbed.

3,620,073
CONTROL WHEEL FORCE STEERING APPARATUS
Burnell N. Robbins, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sept. 18, 1968, Ser. No. 760,469
Int. Cl. G01l *3/00*; G05g *1/04*; B64c *13/04*
U.S. Cl. 73—133 **4 Claims**



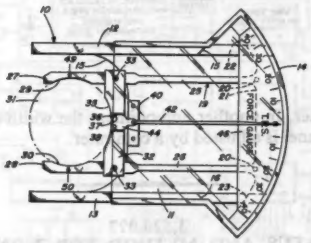
A control wheel force transducer for controlling through an automatic pilot an aircraft in pitch and roll by suitable signals, develops such signals by the use of strain gages or the like incorporated or mounted on a deformable member which is deflected from a normal position on control wheel movement in one direction to supply or generate roll control signals and is deflected on control wheel movement in a second direction at an angle to the first direction to supply or generate pitch control signals.

3,620,074
SHEAR-TYPE TRANSDUCERS COMPENSATED FOR EFFECTS OF NON-UNIFORM BENDING
Eric Laimins, Belmont, and Harry E. Lockery, Sudbury, Mass., assignors to BLH Electronics, Inc., Waltham, Mass.
Filed Jan. 19, 1970, Ser. No. 3,719
Int. Cl. G01l *5/12*
U.S. Cl. 73—141 A **6 Claims**



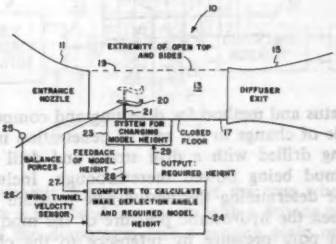
A shear-responsive strain gage transducer, mounted at spaced positions along a load-carrying member to characterize shear and the related loading, but also tending to develop error because of non-uniform bending of the load-carrying member, is structed for inherent mechanical suppression of bending-induced outputs which would not otherwise be electrically self-cancellable; in the case of a preferred weight-characterizing shear-type transducer colleted at two longitudinally-spaced positions inside a hollow non-uniform axle of an aircraft landing gear, the colleted elastically-deformable sensing element carrying the strain gages has an asymmetry of proportions and/or longitudinal orientation which reduces to insignificant amounts any shear-induced displacements resulting from the particular non-uniform bending of that non-uniform axle.

3,620,075
FORCE GAGE (PILOT'S)
William R. Edwards, California, Md., assignor to the United States of America as represented by the Secretary of the Navy
Filed Oct. 22, 1969, Ser. No. 868,540
Int. Cl. G01l *5/12*
U.S. Cl. 73—141 R **3 Claims**



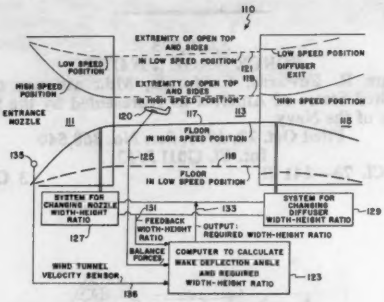
A pilot's force indicating device for positioning on the control stick of an aircraft having resiliently biased portions extending at two opposite sides of the stick and engageable therewith when the device is on the stick and force indicating structure so operatively connected to said portions that upon the pilot applying force on the device, while grasping the same, so that one of said portions pushes against one side of the control stick in connection with controlling the aircraft in flight the indicating structure operates to show the pilot the amount of force that he is then applying to the stick and upon the pilot applying force on the device, while still grasping the same, in the opposite direction so that the other of said portions pushes against the opposite side of the control stick the indicating structure operates to show the pilot the amount of force that he is then applying to the stick.

3,620,076
VARIABLE GEOMETRY WIND TUNNELS
Harry H. Heyson, Hampton, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Oct. 20, 1969, Ser. No. 867,841
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 **4 Claims**


EXTREMITY OF OPEN TOP AND SIDES
ENTRANCE NOZZLE
DIFFUSER EXIT
SYSTEM FOR CHANGING MODEL HEIGHT
CLOSED FLOOR
BALANCE FORCES
FEEDBACK OF MODEL HEIGHT
OUTPUT: REQUIRED HEIGHT
WIND TUNNEL VELOCITY SENSOR
COMPUTER TO CALCULATE WAKE DEFLECTION ANGLE AND REQUIRED MODEL HEIGHT

Variable geometry wind tunnels that will greatly reduce the effect of the wind-tunnel boundaries on the data obtained in subsonic tests representing the low-speed

phases of flight. In one embodiment the model in the tunnel is appropriately adjusted by a system governed by


110
EXTREMITY OF OPEN TOP AND SIDES IN LOW SPEED POSITION
LOW SPEED POSITION
DIFFUSER EXIT
HIGH SPEED POSITION
EXTREMITY OF OPEN TOP AND SIDES IN HIGH SPEED POSITION
ENTRANCE NOZZLE
FLOOR IN HIGH SPEED POSITION
FLOOR IN LOW SPEED POSITION
SYSTEM FOR CHANGING NOZZLE WIDTH-HEIGHT RATIO
FEEDBACK WIDTH-HEIGHT RATIO
OUTPUT: REQUIRED WIDTH-HEIGHT RATIO
SYSTEM FOR CHANGING DIFFUSER WIDTH-HEIGHT RATIO
BALANCE FORCES
COMPUTER TO CALCULATE WAKE DEFLECTION ANGLE AND REQUIRED WIDTH-HEIGHT RATIO
WIND TUNNEL VELOCITY SENSOR

a computer. In another embodiment the width-height ratio of the tunnel is adjusted by a computer.

3,620,077

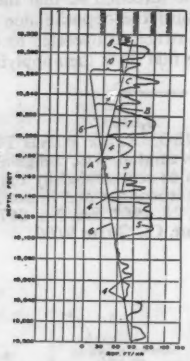
APPARATUS AND METHOD FOR MONITORING BOTTOMHOLE DIFFERENTIAL PRESSURE IN A WELLBORE

Morton E. Brown, San Antonio, Tex., Darrell W. Williams, Newport News, Va., and Albert B. Crownover, Jr., Lafayette, La., assignors to Tenneco Oil Company, Houston, Tex.

Continuation-in-part of application Ser. No. 852,057, Aug. 2, 1969, which is a continuation-in-part of application Ser. No. 688,393, Dec. 6, 1967. This application Mar. 20, 1970, Ser. No. 21,247

Int. Cl. E21b *45/00*

U.S. Cl. 73—151.5 **14 Claims**



Apparatus and method for detecting and computing the magnitude of change in the rate of penetration in a wellbore being drilled with a drill string and drill bit with drilling mud being flowed therethroough. Included are means for determining the bottomhole pressure differential between the hydrostatic pressure of the mud and the formation pore pressure by reference to the change in rate of penetration of the bit. The system has particular use in computing incipient well blowout conditions and predicting the depth at which blowout could occur if conditions remained unchanged.

3,620,078

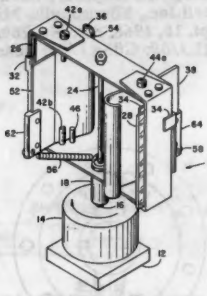
SWING SHIELD FOR ROTO-SLIDE SAMPLER

Gilbert S. Raynor, Manorville, N.Y., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed June 24, 1970, Ser. No. 49,483

Int. Cl. G01w *1/00*; G01n *1/00*

U.S. Cl. 73—170 R **5 Claims**



An automatically opening shield for a particle sampler in which a pair of spring loaded shields protect the collector plates from wind impaction. When the sampler is energized the shields open under influence of centrifugal force and air pressure.

3,620,079

FLUID FLOW MEASURING APPARATUS

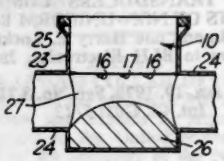
Jacques A. Nosley, Gercuit Ste. Ben grue Labry, Marseille, France

Filed Feb. 12, 1969, Ser. No. 798,692

Claims priority, application France, Feb. 12, 1968, 141,164

Int. Cl. G01p *5/08*

U.S. Cl. 73—194 EM **4 Claims**



An apparatus for measuring the flow of a conductive fluid in a conduit in which a detector, having an electromagnet in a housing and four electrodes on an insulating wall, is disposed in an aperture in the conduit, with the fluid flowing in the conduit contacting the electrodes. Arrangement is made to dispose the electrodes in the flow of fluid regardless of the size of the detector relative to the conduit diameter.

3,620,080

CAPACITANCE TYPE FLUID MEASURING APPARATUS

Frederick L. Ryder, 50 Harrison Ave., Lynbrook, N.Y. 11563

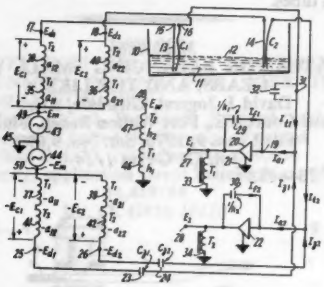
Filed Jan. 15, 1970, Ser. No. 3,095

Int. Cl. G01f *23/26*

U.S. Cl. 73—304 C **15 Claims**

The measuring apparatus includes at least one measuring condenser immersible in fluid in a container. An A.C. driving voltage is applied to each measuring condenser to produce a current. Circuit means produce an output voltage proportional to the excess of the measuring

condenser current over the value of current which would flow through the measuring condenser, in response to the driving voltage, if the condenser were dry. The driving voltage is the sum of a fixed A.C. voltage source and a voltage proportional to the output voltage. The output



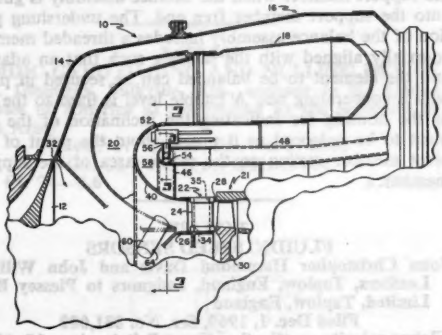
voltage is therefore proportional to the weight of fluid in the container. If more than one measuring condenser is used, an individual output voltage is produced for each, and these voltages are summed to produce a single readout voltage.

3,620,081

FLUIDIC TEMPERATURE SENSOR MOUNT FOR A GAS TURBINE ENGINE

Jay I. Black, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Feb. 2, 1970, Ser. No. 7,551
Int. Cl. G01k *3/06, 13/02*
U.S. Cl. 73—340 **8 Claims**



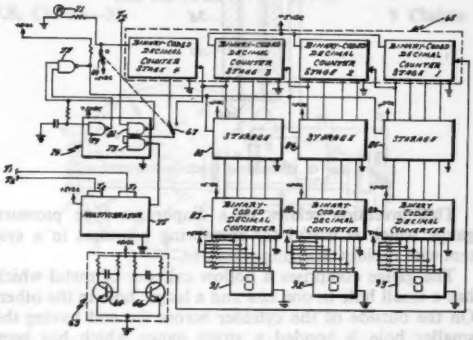
Fluidic temperature sensor assembly for use in measuring the turbine inlet temperatures in a gas turbine engine. A series of circumferentially spaced tubes extending radially into the gas stream, each with a series of spaced inlets, are connected to a circumferential conduit. A discharge conduit extends from the circumferential conduit to a low pressure discharge point so that a relatively high volume, high velocity flow is established through the tubes and conduits. A Y-shaped tubular element is positioned at the junction between the discharge conduit and the circumferential conduit so that the inlets of the Y-shaped tubular element are coaxial with branches of the circumferential conduit to receive gas having a maximum velocity and temperature. The outlet from the Y-shaped tubular element leads to a fluidic oscillator whose pressure oscillations are in direct proportion to the average turbine inlet temperature. The conduits are immersed in cooling air used for a nozzle assembly at the turbine inlet. The portions of the radial tubes extending into the gas stream are covered with a tubular shell having an outlet so that cooling air flows over the tubular elements.

3,620,082

DIGITAL THERMOMETER

Wendell R. Peters, San Antonio, Tex., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Mar. 13, 1970, Ser. No. 19,181
Int. Cl. G01d *5/245, 5/252;* **G01k** *7/24*
U.S. Cl. 73—362 AR **3 Claims**



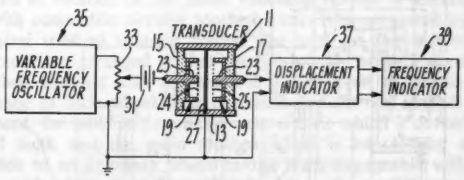
Through a thermistor probe, temperature is converted into a voltage which is integrated for a fixed period of time following which a reference voltage is reverse integrated until the value in the integrator is zero. During the reverse integration a counter operates and upon completion of the reverse integration the value in the counter is converted into a decimal readout indicative of temperature. The counter triggers multivibrator circuits which produce timing pulses for activating switches that control the input to the integrator from the thermistor controlled voltage source and the reference voltage source.

3,620,083

WIDE RANGE DYNAMIC PRESSURE SENSOR

John Dimeff, San Jose, and James W. Lane, Sunnyvale, Calif., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

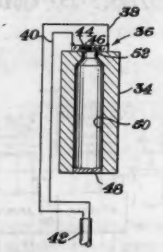
Filed Dec. 4, 1969, Ser. No. 882,122
Int. Cl. G01l *9/12*
U.S. Cl. 73—398 C **4 Claims**



A dynamic pressure sensor of the type wherein a diaphragm is provided in a cavity with a driving plate on one side of the diaphragm and a sensing plate on the other side of the diaphragm wherein the driving and sensing members are perforated and spaced from the walls of the cavity so that damping and apparent stiffness increase induced by increased pressure are reduced. By reducing the

damping and apparent stiffness, the range of the instrument is greatly increased so that it can be used for measuring high and low pressures.

3,620,084
MINIATURE PRESSURE TRANSDUCER
Thomas E. Slykhouse, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed June 3, 1970, Ser. No. 43,158
Int. Cl. G01l 9/06
U.S. Cl. 73—398 AR 5 Claims

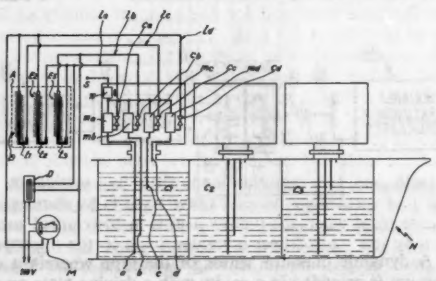


This invention relates to a diaphragm type pressure gauge which is useful for measuring pressures in a system with rapidly changing pressures.

The gauge comprises a hollow cylinder of metal which has a small hole in one end and a larger hole in the other. On the outside of the cylinder across the end having the smaller hole is bonded a strain gauge which has been previously imbedded in a thin plastic film (for example any strain gauge is usable, but a semiconductor is preferred). Any bonding material may be used, but an epoxy resin is preferred.

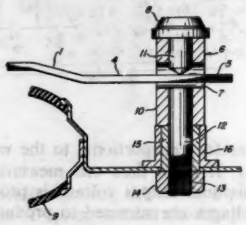
The two or more electrical leads (two if only a single gauge is used) are insulated from the metal by placing a suitable layer of material between the leads and the cylinder. Then the leads are usually secured to the cylinder by taping, potting, etc., and fastened to a suitable electronic circuit.

3,620,085
APPARATUS FOR MEASURING THE LEVEL OF LIQUID IN A RESERVOIR
Danny James Khol, Courbevoie, France, assignor to Cermat, Courbevoie, France
Filed Oct. 15, 1969, Ser. No. 866,700
Claims priority, application France, Mar. 27, 1969, 6909078
Int. Cl. G01f 23/16; G01n 9/28
U.S. Cl. 73—439 12 Claims



At least two manometer tubes, each tube being connected between two probes located at different levels in a reservoir. The probes may be insufflation tubes connected to a gas supply. A scale movable in relation to the manometer tubes carries at least two series of curves, each associated with one of the tubes. Each curve in each series represents the height of liquid in its associated manometer tube for a given level of liquid in the reservoir for a different liquid density. A regulator is interposed between each insufflation tube and its manometer tube for maintaining the flow of gas constant through the insufflation tubes.

3,620,086
APPARATUS FOR BALANCING SMALL WHEELS, GEARS, AND THE LIKE
David J. Jogerst, Glendale, Ariz.
(5 Bedford Court NE., Fort Walton Beach, Fla. 32548)
Filed Feb. 9, 1970, Ser. No. 9,697
Int. Cl. G01m 1/14
U.S. Cl. 73—483 1 Claim



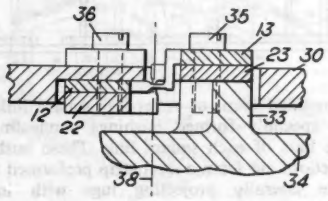
Apparatus is provided for balancing small rotating machine elements such as go-cart wheels, gears, etc. A cantilevered support member is fixed at one end in a vise or by any other suitable means such that the free end extends horizontally. At least a portion of the upper surface of the support member is planar and is adjusted to be approximately horizontal. A generally cylindrical balance assembly includes a diametrically disposed passage extending through the body of a housing portion. A pivot member disposed co-axially within the housing extends downwardly and terminates in a point which rests upon the support member when the balance assembly is guided onto the support member free end. The underslung portion of the balance assembly includes a threaded member co-axially aligned with the housing such that an adapter and the element to be balanced can be secured in place with a cooperating nut. A bubble level is fixed to the top of the housing for indicating the inclination of the element to be balanced as it pivots about the point of the pivot member resting on the planar area of the support member.

3,620,087
FLUIDIC SPEED SENSORS
John Christopher Hammond Davis and John William Leathers, Taplow, England, assignors to Plessey BTR Limited, Taplow, England
Filed Dec. 1, 1969, Ser. No. 881,002
Claims priority, application Great Britain, Apr. 15, 1969, 19,188/69
Int. Cl. G01p 3/34
U.S. Cl. 73—521 8 Claims

A fluidic rotation speed sensing device comprises an operating surface of a rotating body disposed perpendicular to the axis of rotation thereof, a nozzle arranged to

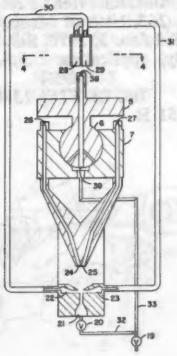
direct a jet of fluid into the boundary layer of said operating surface in a direction having a component perpendicular to the axis of rotation and a collector disposed confronting the nozzle. Due to boundary layer interaction the jet is deflected in the direction of movement of the surface so that the pressure at the collector provides an indication of the rate of rotation.

3,620,088
IMPROVEMENTS RELATING TO RESILIENT SUSPENSION MEANS FOR VIBRATING-ROTOR GYROSCOPES
Derek William Alford, Bracknell, England, assignor to Ferranti Limited, Hollinwood, England
Filed Oct. 27, 1969, Ser. No. 869,640
Claims priority, application Great Britain, Nov. 15, 1968, 54,419/68
Int. Cl. G01c *19/18*
U.S. Cl. 74—5 **9 Claims**



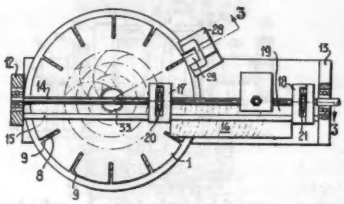
A suspension for mounting one member for limited rotation relative to another member about a required axis comprises two laminar springs each permitting rotation about a given axis. Each spring is provided with mounting blocks which may be clamped to one another and to the two members so that the given axis of each spring coincides with the required axis and the bending planes of the two springs intersect.

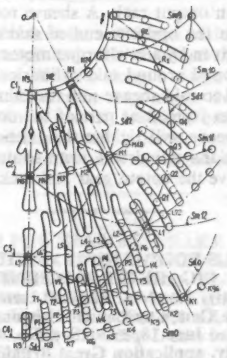
3,620,089
FLUIDIC GYRO CAGING AND NULLING DEVICE
J. C. Dunaway, Falkville, Ala., assignor to the United States of America as represented by the Secretary of the Army
Filed Nov. 6, 1969, Ser. No. 874,608
Int. Cl. F15c *1/14*; G01c *19/28*
U.S. Cl. 74—5.6 **3 Claims**



A gyro rotor having an air bearing ball is caged by a fluidic system that forces the ball against one side of its housing. The fluidic system also forces the rotor to a predetermined spin axis null position. The rotor is uncaged by inactivating the fluidic system. The rotor ball is supported by air supplied to its housing, with the air exiting along the spin axis of the rotor. The fluidic system includes a proportional amplifier having feedback pickoffs fed by the air exiting along the rotor spin axis.

3,620,090
DIGITAL INTEGRATOR
René Béguin and Christof Walter Burckhardt, Geneva, Switzerland, assignors to Test, Société Anonyme d'Etudes Techniques, Chene-Bougeries, Switzerland
Filed Oct. 1, 1969, Ser. No. 862,792
Claims priority, application Switzerland, Oct. 2, 1968, 14,736/68
Int. Cl. F16h *19/04, 25/08*
U.S. Cl. 74—31 **9 Claims**

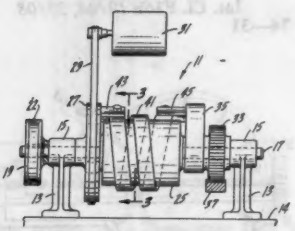




A digital intergrator includes a circular table having a toothed surface mounted for rotation about a central axis. A toothed wheel is rotatably supported for engagement with the table teeth and for displacement radially of the axis of rotation of the table. The table surface is formed with concentric circular toothed tracks interconnected by spiral toothed transfer tracks. The teeth of the various tracks are arranged so that rotation of the toothed wheel when engaged with any track is proportional to the distance of such wheel from the table axis. In one embodiment, the table surface has a central zone which is devoid of teeth and the main toothed wheel is coupled by a slide to an auxiliary wheel having teeth engageable with a guide plate when the main wheel is in the central zone, whereby the main wheel is guided back to the appropriate track of the table on leaving the central zone. Adjustment of the radial distance of the main wheel from the axis of rotation is effected by centrally pivoted fingers circumferentially spaced around the table. Each finger normally has one end engaged in a fixed circular guide track, its other end engaging a groove in the slide over a limited portion of the circular path of the finger. Actuation of a

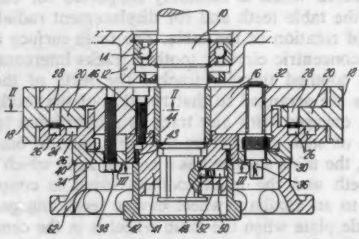
control electromagnet causes the one end of the finger to be temporarily deflected into either of two lateral guide tracks which diverge from the circular guide track and then rejoin it. The resulting movement of the other end of the finger indexes the slide a given radial distance.

3,620,091
POWER AMPLIFIER
Robert W. Schmidt, 5744 W. 77th St., Oak Lawn, Ill. 60459
Filed Oct. 22, 1969, Ser. No. 868,383
Int. Cl. F16h *19/04*
U.S. Cl. 74—34 **4 Claims**



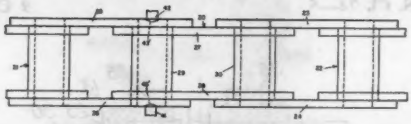
A power amplifier including a cylindrical drum mounted on a shaft which is rotatably driven by a high torque motor. An output gear is rotatably mounted on this shaft adjacent one end of the cylindrical drum and meshes with an output rack. A sheave rotatably mounted on the shaft at the opposite end of said cylindrical drum is rotatably driven by a low torque motor. A friction band is helically wound around said cylindrical drum with one end connected to said sheave and the other end connected to a crank arm formed as part of the output gear. Rotation of the sheave will tighten the frictional band in engagement with the cylindrical drum so that the cylindrical drum may drive the output gear and rack.

3,620,092
CONTINUOUS ROD MAKING MACHINES SUCH AS CIGARETTE MACHINES
Philip A. Maw, London, England, assignor to Molins Machine Company Limited, London, England
Filed June 18, 1970, Ser. No. 47,317
Claims priority, application Great Britain, June 24, 1969, 31,794/69
Int. Cl. F16h *55/54*
U.S. Cl. 74—230.23 **10 Claims**



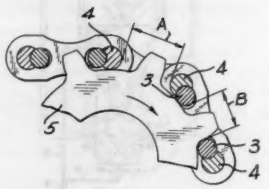
A variable diameter pulley for use in driving the garniture tape of a continuous rod cigarette-making or filter plug-making machine comprises a plurality of equally-spaced radially slidable segments each having an axial protrusion engaging in a corresponding cam slot in a cam disc. The cam disc is rotatable relative to the segments to cause radial movement of the segments and hence alter the diameter of the pulley. The cam slots are arranged in two concentric rings, of different mean radii, with the cam slots in the two rings overlapping each other; that is to say, each cam slot subtends an angle at the centre of the pulley greater than the angular spacing of the segments.

3,620,093
SQUARE LINK CHAINS, AND THE MANUFACTURE THEREOF
Robert L. Crowson, Fulton, Ill. (% Allied Chains, Inc., Green River Industrial Park, Dixon, Ill. 61021)
Filed July 30, 1969, Ser. No. 846,114
Int. Cl. F16g *13/02*
U.S. Cl. 74—250 R **8 Claims**



A simplified form of roller-less square link chain including specially formed bushings connecting together the side bars of each square link. These bushings comprise sections cut from a steel strip preformed to produce alternate laterally projecting lugs with intermediate square notches, with the lugs at the two edges of the strip produced oppositely in pairs and the intervening notches also produced opposite to each other in pairs. Each such strip section includes two lugs and two notches. Each section cut off from the strip is rolled into cylindrical form to bring its ends together to form the cylinder. Such cylinder then includes a continuous cylindrical body having at each end two diametrically opposite axially extending lugs, separated by intermediate notches. Each square link side bar is provided with partially circular openings at its ends, and such side bar is seated onto the proximate end of the bushing, with the lugs extending through the side bar opening, and with the edge portion of the side bar seated against the notches thus limiting the seating operation of such side bar onto such bushing end portion, and thus retaining the two side bars at desired limited spacing from each other.

3,620,094
FLAT-LINK CHAIN
Ilya Ilich Ivashkov, 9 Parkovaya ulitsa 43/26, kv. 198, and Vasily Alexandrovich Frolovtsev, Ferganskaya ulitsa 18, kv. 263, both of Moscow, U.S.S.R.
Filed Jan. 2, 1970, Ser. No. 277
Claims priority, application U.S.S.R., Feb. 18, 1969, 54/94
Int. Cl. F16g *13/02*
U.S. Cl. 74—251 R **1 Claim**



Flat-link chains, wherein the hinge joints of the links are formed by support members secured in the end portions of the plates and contacting one another with their

outer working surfaces, of which one is convex and the other is concave, whereupon the space between adjacent support members with a concave working surface being made greater than the space between adjacent support members with a convex working surface.

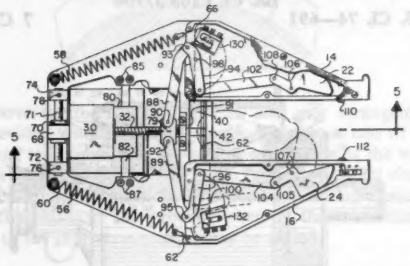
Proposed chain is highly reliable and durable.

3,620,095

MECHANICALLY ACTUATED TRIGGERED HAND

Dan H. Dane, Huntsville, Ala., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 3, 1970, Ser. No. 69,209
Int. Cl. A61f 1/06
U.S. Cl. 74—469 7 Claims



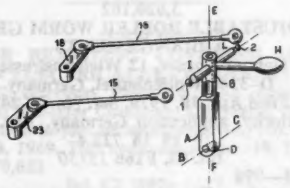
A mechanically actuated hand that can grasp an object like a trigger actuated tool and depress the trigger of the tool. The hand includes a supporting frame, a pair of jaw members slidably mounted on the frame and a drive assembly slidably mounted on the frame and mechanically coupled to the jaw members for permitting movement thereof along the frame. A trigger device mounted in each jaw member is connected by a mechanical linkage to the drive assembly so as to be actuated thereby. A brake mechanism is mounted on the frame adjacent each jaw member for selectively immobilizing the jaw members. A touch control device mounted in each jaw member is actuated by a predetermined contact force with an object being grasped and the touch control in turn actuates the brake mechanism to immobilize the jaw member relative to the frame.

3,620,096

SINGLE MANEUVERING LEVEL CONTROL FOR TRACKED VEHICLES

Gianni Scolari, Via Turati 35, Turin, Italy

Filed Aug. 27, 1969, Ser. No. 853,403
Claims priority, application Italy, Aug. 28, 1968, 52,963/68
Int. Cl. G05g 9/00
U.S. Cl. 74—469 4 Claims



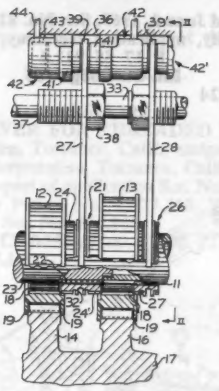
A single maneuvering lever controls the delivery of hydraulic fluid of both the variable-feed pumps of hydraulic motors employed in tracked vehicles. The several variances of mechanical assembly are, however, based on the same principle of controlling with a single lever, operable with one single hand, both tracks of a tracked vehicle.

3,620,097

SHIFT FORK MECHANISM FOR DRIVE TRANSMISSIONS

Charles H. Herr, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 15, 1969, Ser. No. 887,803
Int. Cl. G05g 9/00
U.S. Cl. 74—473 4 Claims



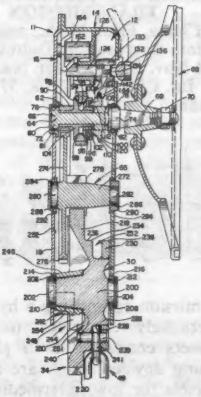
Shifting of clutch collars within a multiple speed ratio gear box is accomplished with simplified shift forks which are flat members slidable along a single fixed shaft by fluid operated cylinders in response to fluid control signals. All shift forks are of identical configuration and are interchangeable to provide a compact system which can be economically manufactured and repaired.

3,620,098

HIGH POWER HAND BRAKE AND CHAIN STOP THEREFOR

Eldred H. Natschke, Bourbonnais, Ill., assignor to Universal Railway Devices Company

Filed July 6, 1970, Ser. No. 52,536
Int. Cl. G05g 1/08
U.S. Cl. 74—505 9 Claims



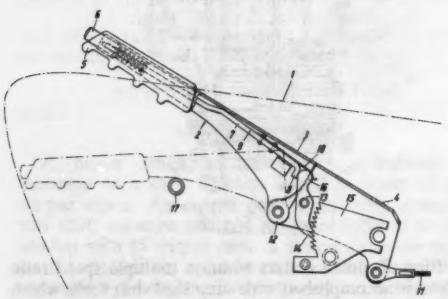
A vertical wheel hand brake which is especially arranged to provide the increased power needed for 125 ton cars and up in weight and which includes a special

gear cluster interposed between the brake drum gear and ratchet wheel pinion for this purpose. The hand brake also includes a brake chain stop arrangement that avoids winding up of the brake chain in the wrong direction, and limits overtravel of the drum on release of the brake.

3,620,099
HINGE OPERATING LEVER FOR USE IN VEHICLES, PARTICULARLY AS A HAND BRAKE LEVER FOR AUTOMOTIVE VEHICLES

Erich Stotz, Rommelshausen, Germany, assignor to Firma Dr.-Ing. h.c.F. Porsche K.G., Stuttgart-Zuffenhausen, Germany

Filed June 2, 1969, Ser. No. 829,172
Claims priority, application Germany, July 9, 1968, P 17 55 911.4
Int. Cl. G05g *1/04*
U.S. Cl. 74—524 **19 Claims**

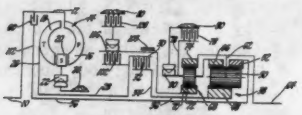


A hinged operating lever which can be used as a hand brake in an automotive vehicle has two hingedly connected parts, the first of which constitutes a handle. A pawl is rotatably mounted on the second part and is engageable in a detent plate to secure the hand brake. The pawl is also releasable by a control linkage comprising a control rod and a leaf spring which thereby permits the handle to be folded down out of the way of a passenger when exiting from the vehicle by the application of hand pressure to the handle.

3,620,100
HIGH RATIO COVERAGE AUTOMATIC TRANSMISSION

Howard E. Chana, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1969, Ser. No. 880,779
Int. Cl. F16h *47/08, 57/10*
U.S. Cl. 74—688 **9 Claims**

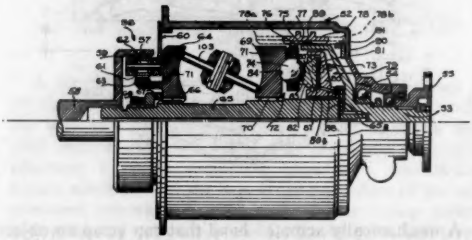


Power transmission comprising a hydrodynamic torque converter operatively connected to first and second planetary gearsets connected to a plurality of friction drive establishing devices which are engageable to condition the gearsets for low, intermediate, high and overdrive. In the preferred embodiment for low speed ratio, the first gearset is conditioned to produce an underdrive by the automatic engagement of a one-way brake with a first sun gear being driven. Intermediate ratio is obtained by additionally conditioning a second one-way brake to hold a reaction gear in the second planetary gearset so that gearsets combine to increase output speed. In direct or 1:1 ratio the drive can be all converter, all mechanical or split torque. There is a front clutch engaged for the all mechanical and the split torque direct drives. Also, this clutch is engaged for a mechanical overdrive with the gearsets again combining.

3,620,101
VARIABLE GEARS

Randle L. Abbott, Leamington Spa, and Paul C. Green, Coventry, England, assignors to GKN Birfield Transmissions Limited, Birmingham, England

Filed July 9, 1969, Ser. No. 840,413
Claims priority, application Great Britain, July 16, 1968, 33,755/68; Oct. 1, 1968, 46,455/68
Int. Cl. F16h *37/08*
U.S. Cl. 74—691 **7 Claims**



The specification discloses a steplessly-variable frictional gear which finds particular utility as an automotive transmission The gear includes a known unit comprising driving and driven co-axial discs having toroidal surfaces which are arranged in face to face relation and which are engaged by rollers whose inclinations can be varied to vary the gear ratio of the unit. Combined with the latter are first, constant-engagement drive means interposed between the input of the gear and the driving disc of the unit and second, constant-engagement drive means interposed between the output of the gear and the driven disc, the discs being arranged so that by varying the inclination of the rollers the gear gives:

(1) a reverse reduction drive in which the output member rotates in a direction opposite to, and at a speed less than, the input member;
(2) a neutral in which the output member is stationary and the first and second inputs to the second, constant-engagement drive means cancel each other out; and
(3) a forward drive in which the input and output members rotate in the same direction and in which the output member rotates at speeds both greater and less than the speed of the input member.

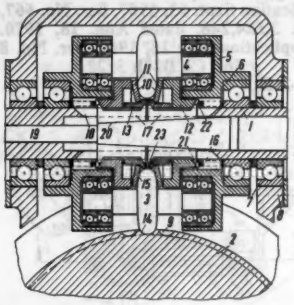
3,620,102
ADJUSTABLE ROLLER WORM GEAR ARRANGEMENTS

Helmut Korner, 12 Wichernstrasse, D–3340 Wolfenbuttel, Germany

Filed Apr. 10, 1970, Ser. No. 27,247
Claims priority, application Germany, Apr. 12, 1969, P 19 18 721.4
Int. Cl. F16h *15/50*
U.S. Cl. 74—796 **17 Claims**

An adjustable roller worm gear arrangement is disclosed. The gear arrangement comprises an input shaft supporting a carrier carrying a number of rolling elements which rotate in a planetary path around the input shaft

when the latter is driven. The rolling elements successively engage helical grooves in a worm wheel which is mounted on an output shaft transversely inclined to the input shaft. Circumferential portions of each rolling element contact a pair of adjacent annular track members, which are mounted on the input shaft and which define the walls of



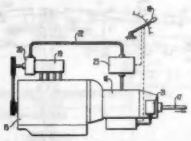
a groove for the rolling elements. The gear arrangement is provided with means for displacing at least one of the pairs of track members to vary the inclination of the walls of the groove and hence the mean radius of contact circles defined by points of contact between the rolling elements and the walls of the groove, whereby the transmission ratio of the gear arrangement may be varied.

3,620,103

CONTROL SYSTEM OF AUTOMATICALLY SHIFTING TRANSMISSIONS, ESPECIALLY FOR MOTOR VEHICLES

Hans-Joachim M. Förster, Stuttgart-Riedenberg, and Ulrich Eltze, Esslingen (Neckar), Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 5, 1969, Ser. No. 882,467
Claims priority, application Germany, Dec. 5, 1968, P 18 12 931.2
Int. Cl. F02d *37/00*
U.S. Cl. 74—860 **11 Claims**



A control for automatic transmissions of vehicles driven by an engine, in which a first rotational speed controller associated with the transmission controls the shifting-up limits in the transmission and the driving engine includes a second rotational speed controller limiting its maximum rotational speed; the two rotational speed controllers are thereby so connected that one of the rotational speed controllers assumes simultaneously the function of the other.

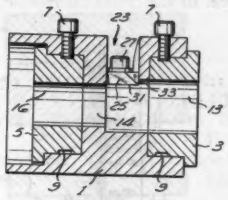
3,620,104

TOOL FOR REMOVING COVERING MATERIAL FROM AN ELECTRICALLY CONDUCTIVE CABLE

Raymond G. Horrocks, Parkview, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Continuation-in-part of application Ser. No. 846,196, July 30, 1969. This application Nov. 19, 1969, Ser. No. 870,022
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.5 C **10 Claims**

A hand tool for removing insulation and/or semiconductive material from an electrically conductive cable. The tool includes a cylindrical body through which a cable may be moved endwise and a blade fixed to the body and having two cutting edges positioned in planes parallel



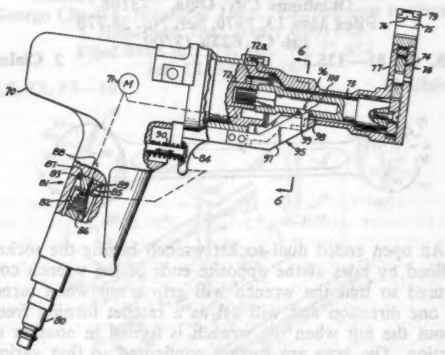
to and transverse to the centerline of the cable respectively.

3,620,105

OFFSET DRIVER FOR THREADED FASTENERS

Ronald W. Batten, Torrance, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Continuation-in-part of application Ser. No. 666,435, Sept. 8, 1967, now Patent No. 3,477,318. This application Nov. 7, 1969, Ser. No. 874,868
Int. Cl. B25b *13/00, 17/00, 21/00*
U.S. Cl. 81—57.14 **3 Claims**



This invention relates to a driver for setting threaded fasteners in height-limited environments. The driving portion of the device need not be moved axially, but may be applied to the fastener it is to set by lateral movements, thereby significantly reducing height and manipulations. It includes a body to which are mounted a power shaft and a laterally extending gear train driven by the power shaft which gear train terminates in a pair of branches. Each branch includes a driven gear that is engaged to a driving socket. The socket and the body have alignable slots and the angular extent of the slot at the periphery is less than the angular spacing of the driving gears around the center of rotation of the socket whereby the socket is always driven by at least one of the branches. Means is provided for turning the socket independently of finger actuation so that the socket and body slots can be aligned, and detent means is provided to hold them aligned.

3,620,106

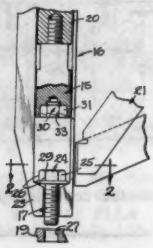
WRENCH-TYPE SOCKET

Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Filed Dec. 16, 1968, Ser. No. 783,865
Int. Cl. B25b *13/06*
U.S. Cl. 81—121 **3 Claims**

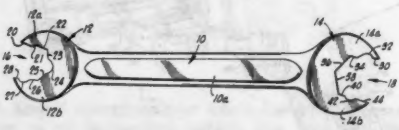
Usable with an automatic assembly device, a wrench-type socket for driving a screw with a hexagonal head includes a hexagonal recess for drivingly engaging the head

and a cylindrical counter-recess for telescopically receiving the head regardless of the relative angular positions of the socket and the screw. The bottom of the counter-recess is formed as a series of angularly spaced and in-



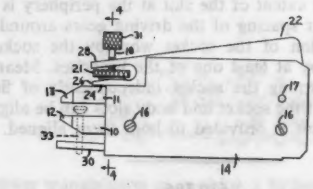
clined relief surfaces which pilot the head into driving engagement with the recess and which allow the socket to turn into driving engagement with the head while continuously telescoping over the head.

3,620,107
SPEED WRENCH
James P. Evans, 3233 SW. 23rd St., Oklahoma City, Okla. 73108
Filed May 13, 1970, Ser. No. 36,778
Int. Cl. B25b *13/00*
U.S. Cl. 81—125.1 **2 Claims**



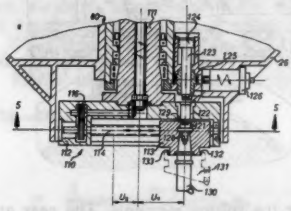
An open ended dual socket wrench having the sockets defined by jaws at the opposite ends of the wrench configured so that the wrench will grip a nut when turned in one direction and will act as a ratchet turning freely about the nut when the wrench is turned in another direction. The jaws are further configured so that various sizes of nuts may be engaged by the jaws for purposes of loosening the nuts.

3,620,108
PLIERS
Wesley R. Door, Rio Piedras, Puerto Rico, assignor to USM Corporation, Boston, Mass.
Filed Feb. 13, 1970,, Ser. No. 11,214
Int. Cl. B25b *7/04, 7/12*
U.S. Cl. 81—341 **8 Claims**



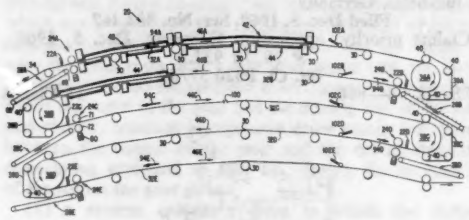
A pair of pliers comprising a first fixed rigid jaw and an adjacent elongated pivoted jaw mounted between protective side plates. A perpendicular rod mounted to the first jaw extends through the second jaw and is threadably engaged by a movable collar. A cam assembly in the form of a pivoted lever is interposed between the second jaw and the collar. A yieldable slide is mounted adjacent to the first jaw for selectively clamping a ring in place.

3,620,109
MACHINE TOOL WITH FACING TOOL SLIDE FOR AUTOMATIC TOOL CHANGING
Alfred W. Dürr, Otto Gunsser, and Hubert H. Heller, Nurtingen, Wurttemberg, Germany, assignors to Gebruder Heller Maschinenfabrik G.m.b.H., Nurtingen, Wurttemberg, Germany
Original application Sept. 13, 1967, Ser. No. 667,441, now Patent No. 3,524,248, dated Aug. 18, 1970. Divided and this application July 15, 1969, Ser. No. 841,940
Int. Cl. B23b *3/22*
U.S. Cl. 82—2 E **2 Claims**



A machine tool with automatic tool changing is described with a tool holder having a central tightening screw and lock and a face slide including an indexing pin as well as two compensating weight threaded spindles.

3,620,110
BROKE CLEARING APPARATUS
Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.
Filed July 23, 1970, Ser. No. 57,683
Int. Cl. B26d *5/20*
U.S. Cl. 83—66 **13 Claims**

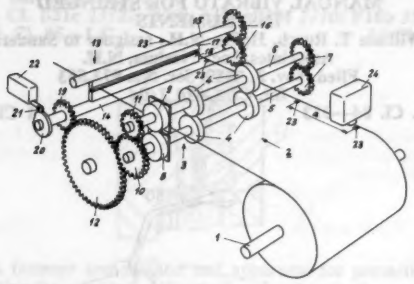


Apparatus for clearing broke from machines for drying web type materials which includes a broke conveyor, a cutter for severing the web when a break occurs, and reversing rolls for conducting the severed portion of the web to the broke conveyor.

3,620,111
DEVICE FOR THE FEEDING AND CYCLIC TREATMENT OF A BODY WITH SYNCHRONIZING OF TREATMENT DEVICE AND FEED DEVICE
Fritz Bosshard, Kaltenbach, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed Dec. 1, 1969, Ser. No. 881,014
Claims priority, application Switzerland, Dec. 3, 1968, 18,004/68
Int. Cl. B23d *25/12*
U.S. Cl. 83—74 **8 Claims**

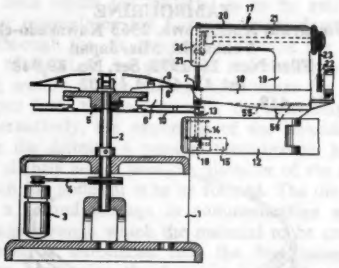
A device for feeding and cyclically processing a longitudinal body, for instance, a web of sheet material which is withdrawn from a supply roll and is to be cut into individual pieces of the desired length. A feeding device provided with rollers on at least one shaft is rotated during the operation of a processing device, such as a cutter

when a web is to be cut, alternately with a high speed and a lower speed. The processing device also has at least one shaft which is rotated always with the same speed. For synchronizing the feeding device and the processing device a photoelectric scanning head is provided which scans marks arranged in lengthwise spaced relation on



the longitudinal body and operates a relay which latter controls electro-magnetic clutches in the feeding device and a control cam for effecting a speed control of said feeding device in such manner that after a few initial uneven feed operations the longitudinal body is advanced with uniform speed in relation to the processing device.

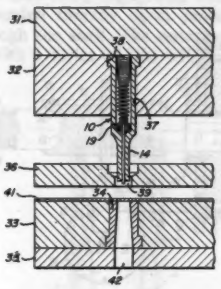
3,620,112
TRIMMING DEVICE FOR TRIMMING THE EDGES OF WORKPIECE CUTS
Hubert Jünemann, Bielefeld, Germany, assignor to Kochs Adlernahmaschinen Werke AG, Bielefeld, Germany
Filed Jan. 29, 1970, Ser. No. 6,697
Claims priority, application Germany, Jan. 30, 1969, P 19 04 385.7
Int. Cl. B26d *7/06*
U.S. Cl. 83—98 **10 Claims**



An edge trimming device for trimming the edges of workpiece cuts consisting of textiles, thin leather or similar material, at which the workpiece cuts are received in workpiece holders secured to a rotary-table. The trimming tools are arranged in a housing like a sewing machine, and the shape of the cuts is determined by templates which are placed below the workpiece holders and cooperate with a driven magnetic roller. A device for discharging the cutting scrap out of the device is provided.

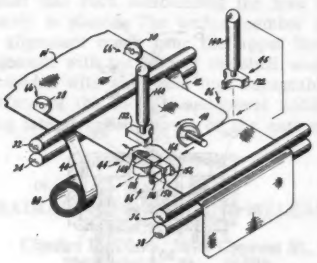
3,620,113
EJECTOR TYPE PUNCH
Robert J. Gargrave, Dayton, Ohio, assignor to Dayton Progress Corporation, Dayton, Ohio
Filed Sept. 8, 1969, Ser. No. 856,125
Int. Cl. B26f *1/14*
U.S. Cl. 83—98 **15 Claims**

A piercing or forming punch assembly having a headed reciprocable ejector member accommodated in the punch body. A uniquely formed urethane washer or like device is fitted around the shank of the ejector member to the underside of the head thereof to act as a load distributing



and shock absorbing medium. The washer is constructed to provide a pump supplying air to the working face of the punch for vacuum breaking and debris clearing purposes.

3,620,114
SHEET MATERIAL CUTTING MACHINE
George Chudyk, Woodcliff Lake, N.J., assignor to Oscar I. Judelshon, Inc., Jersey City, N.J.
Filed Mar. 9, 1970, Ser. No. 17,452
Int. Cl. B26d *9/00*
U.S. Cl. 83—107 **10 Claims**

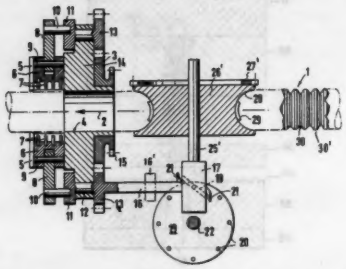


A machine for cutting a continuous web of textile material into individual rectangular sheets having rounded corners. The machine continuously cuts bands of material from each side of the web as it travels and intermittently makes transverse cuts across the web to form sheets of proper length. A die cutting device cuts rounded corners on the sheets. The machine operates automatically to provide the several functions and may be adjusted to cut rectangular sheets of various lengths and widths.

3,620,115
APPARATUS FOR MAKING PERFORATIONS IN CORRUGATED TUBES
Wilhelm Zieg, Georg Schmidt, Edgar Hauck, and Ingo Massell, Konigsberg, Bay, and Gustav Gruebel, Altershausen, Germany, assignors to Frankische Isolierrohr- und Metallwaren-Werke Gebr. Kirchner, Konigsberg, Beyern, Germany
Filed Dec. 31, 1968, Ser. No. 788,277
Claims priority, application Germany, Mar. 28, 1968, P 17 78 094.8
Int. Cl. B26d *5/22*; B23d *21/00*
U.S. Cl. 83—226 **15 Claims**

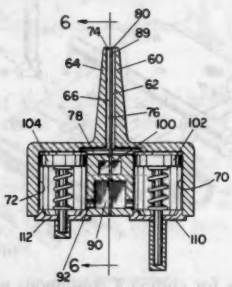
Apparatus for making perforations in helically or circumferentially corrugated plastic tubes comprises flat plate-like perforating tools which are movable radially

toward and away from the tube, a feeding mechanism which advances the tube, either stepwise or continuously, and driven carriers which support the tools and are movable radially of the tube or in planes which include the



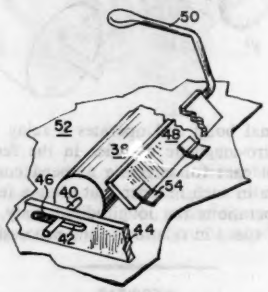
axis of the tube. Each tool has a cutting edge which is flanked by receding surfaces at both sides and is provided with pronounced teeth having tips located at the same level or at different levels.

3,620,116
KEYBOARD PLAYER APPARATUS
David N. Ulry, 4380 Donington Road, Columbus, Ohio 43220
Filed May 15, 1970, Ser. No. 37,785
Int. Cl. G10f *3/00*
U.S. Cl. 84—111 **2 Claims**



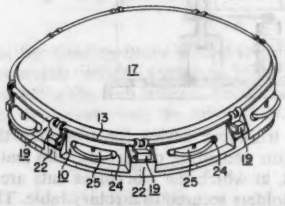
A portable pneumatic actuating apparatus for actuating the keys of a keyboard musical instrument is disclosed for automatically playing the instrument. The apparatus has a pair of mating cylinder housings extending the length of the keyboard, each housing provided with a longitudinal series of cylinders. Each cylinder housing has a longitudinal surface interfacing the longitudinal surface of the other cylinder housing. Channels are formed in the interfacing surfaces. Each channel connects the upper end of a cylinder to its inlet port on a tracker bar. The inlet ports are spaced along a portion of an edge of the interfacing surfaces and this portion of the edge serves as the tracker bar. A longitudinal outlet channel is formed in each interfacing surface for connecting the lower end of each cylinder to a vacuum pump. An undersized piston is slidably mounted in each cylinder and has a piston rod connected to the piston and extending downwardly toward a key of the keyboard. Each piston is spring biased toward the inlet end of the cylinder and away from the key. The interfacing surfaces of each cylinder housing are sealingly mounted against opposite sides of an impervious membrane. A perforated music sheet is passed across the tracker bar edge of the cylinder housing, thereby selectively blocking and unblocking the inlet passageways. Blocking of the inlet passageways prevents actuation of the pistons and thereby of the keys; unblocking of the inlet passageways permits the vacuum pump to move the piston and actuate the key.

3,620,117
MANUAL VIBRATO FOR STRINGED INSTRUMENTS
William T. Rusch, Hollis, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Nov. 3, 1969, Ser. No. 873,553
Int. Cl. G01d *3/04*
U.S. Cl. 84—313 **1 Claim**



A manual vibrato is herein disclosed, comprising a bar which is positioned below or above the strings of the instrument at the normal position of the bridge on conventional instruments, whereby rotating or sliding of the bar along the strings causes pitch variation.

3,620,118
TAMBOURINE
Yoshiyuki Koishikawa, 2365 Kawarado-cho, Yokkaichi, Mie, Japan
Filed Nov. 16, 1970, Ser. No. 89,948
Int. Cl. G10d *13/02*
U.S. Cl. 84—418 **4 Claims**



A tambourine comprising a cylindrical frame having a plurality of recesses formed in the upper surface thereof at a predetermined interval, a tightening ring having a plurality of projections formed on the surface confronting said cylindrical frame at a predetermined interval for interlocking engagement with said recesses respectively, a tambourine sheet having a plurality of through-holes formed in the peripheral edge portion at a predetermined interval for receiving said projections respectively when it is clamped between said cylindrical frame and said tightening ring at its peripheral edge, and a tightening member for tightening said tightening ring around said cylindrical frame.

3,620,119

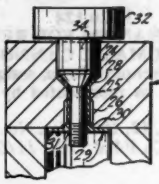
FASTENERS AND METHOD AND APPARATUS FOR FORMING FASTENERS

John O. King, Jr., 110 Lake Forrest Lane NE., Atlanta, Ga. 30305, and Charles F. Marschner, 595 Wisteria Drive, Mairetta, Ga. 30060

Continuation-in-part of application Ser. No. 711,368, Mar. 7, 1968. This application Aug. 21, 1968, Ser. No. 754,194

Int. Cl. B21c *23/22;* B28b *1/24;* B29f *1/10;* F16b *35/00*

U.S. Cl. 85—1 C 16 Claims



A fastener and method and apparatus for protectively coating the working surfaces of same wherein the method comprises the step of extruding a thin metallic material onto the unthreaded shank portion of a fastener in intimate contact therewith to enlarge the effective diameter of the fastener while producing an anti-corrosive material between the material of the fastener proper and the work pieces which the fastener connects after the fastener is installed. The method may also include plating covering the surface of the fastener with a material which acts as a lubricant during the extrusion of the surface material about the shank portion of the fastener, or the lubrication of the dies used to extrude the material about the shank portion of the fastener prior to the extrusion operation, or lubricating the surfaces of the metallic material that is to be extruded onto the fastener prior to the extruding operation.

The apparatus of the invention includes a die defining a passage therethrough which has an extruding section with a diameter slightly larger than the diameter of the fastener onto which the material is to be extruded, a means for maintaining the fastener centered within the passage through the die, means for forcing the fastener and the material to be extruded thereon through the extruding section of the passage and means for ejecting the fastener from the passage after the extruding operation. Alternatively, the apparatus of the invention may include a die defining a passage therethrough having a diameter slightly larger than the diameter of the fastener onto which the material is to be formed. The die further includes a second passage in communication with the first passage through which the material to be coated on the fastener is introduced into the first passage and means for positioning the fastener in the first passage and centering the same while the material is forced from the second passage into the first passage and around the fastener to coat the same.

The fastener has a thin surface material formed directly onto the unthreaded shank portion and the underside of the head of the fastener. The unthreaded shank portion may have a reduced diameter from the normally standard one, and the thin coating material may enlarge this portion to the normal standard diameter.

3,620,120

MINE ROOF BOLT ASSEMBLY

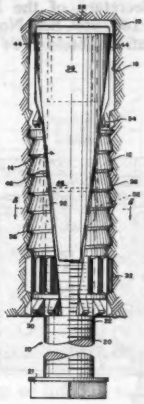
Richard H. Warner, Landmark Apartments, 6303 Indian School Road NE., Albuquerque, N. Mex. 87110

Filed May 1, 1969, Ser. No. 820,770

Int. Cl. F16b *13/06*

U.S. Cl. 85—76 6 Claims

A mine roof bolt assembly including a roof bolt having a head at one end and threaded at the other end, a wedge member having tapering walls threadedly engaged with the roof bolt, and an expansion shell positioned over the wedge member and actuated thereby, the expansion shell including a pair of ears connected by a bale, the inner surface of the ears being engageable with the wedge member and expanded thereby upon passage of the wedge member through the shell. The outer surface of the shell is provided with a series of ribs which are angularly disposed transversely of each ear, for effecting "threading" of the shell into rock surrounding the hole into which the assembly is placed. The wedge member is provided with an alignment notch near the upper limit thereof, for engagement with the bale of the shell, and the lower end is provided with alignment lugs engageable with the inner surface of the shell, the aligment notch and lugs preventing lateral misalignment of the ears and wedge.



3,620,121

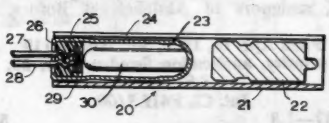
RADIAL ACTUATOR AND RELEASE MECHANISM

Charles R. Olsen, 2020 Cypress St., Philadelphia, Pa. 19103

Filed Apr. 15, 1969, Ser. No. 816,272

Int. Cl. F16b *1/00*

U.S. Cl. 89—1 5 Claims



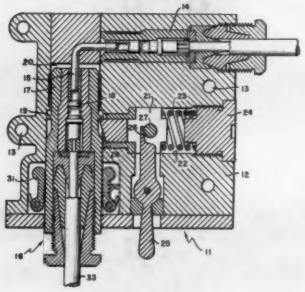
A hollow tube or radial actuator containing an explosive charge, or a means of pressurizing the interior of the tube from an external source, is deformed by flattening, indenting, or fluting, so that the volume of the tube is substantially reduced. When the tube is pressurized by firing the explosive charge, or by an external pressure source, the tube inflates, and attempts to resume a cylindrical shape. In resuming a cylindrical shape, the split tubular retainer is expanded releasing a and performs a useful function. In the application shown in this disclosure, the tube is situated within a split tubular retainer of a release mechanism which is indented to match the initial flutes, or deformation of the

actuator. When the actuator resumes its cylindrical shape, the tube transfers force to an external mechanism, pin, or device, which was held captive in the retainer.

3,620,122
CONNECTOR ASSEMBLY FOR DISPOSABLE BOMB ARMING DEVICE

William K. Kuntz and George E. Souviner, Indianapolis, Ind., assignors to the United States of America as represented by the Secretary of the Navy

Filed Aug. 14, 1969, Ser. No. 850,147
Int. Cl. B64d *1/04*
U.S. Cl. 89—1.5 D 1 Claim

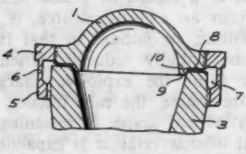


A connector assembly having a stationarily mounted connector section with one or more connector pins and a removable connector section with one or more mating connector pins. The removable connector section is provided with a deformable locking flange and a spring-biased plunger is slidably mounted in the stationarily mounted connector section and engageable with the locking flange to lock the two connector sections together. Upon release of a bomb arming device, the locking flange is deformed or ruptured and the two connector sections are separated. A pivotal lever is provided for separating the two connector sections without deforming the locking flange.

3,620,123
CLOSING DEVICE FOR THE NOZZLE OF A PROJECTILE FURNISHED WITH A ROCKET-MOTOR

Per-Olof Davidsson and Karl Gösta Högberg, Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Apr. 16, 1970, Ser. No. 29,119
Claims priority, application Sweden, Apr. 23, 1969, 5,817/69
Int. Cl. F41f *3/00*
U.S. Cl. 89—1.8 8 Claims

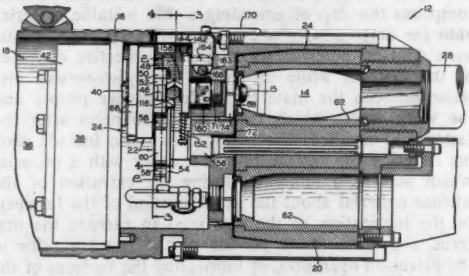


A cap for closing the nozzle of the rocket engine in a rocket-propelled projectile which is to be launched by means of a barrel and an external drive charge. The cap has a main portion for making a sealing contact with the edge of the nozzle, a threaded portion screwed onto the outside of the nozzle, and a weakened circumferential portion between the main portion and the threaded portion. During the travel of the projectile through the barrel the weakened portion is ruptured by the pressure exerted by the combustion gases produced by the drive charge whereby the holding connection between the nozzle and the main portion of the cap is severed.

3,620,124
FIRING MECHANISM FOR REVERSIBLE AUTOMATIC CANNON

Harold H. Wiese, Davenport, Iowa, assignor to the United States of America as represented by the Secretary of the Army

Filed Jan. 12, 1970, Ser. No. 2,305
Int. Cl. F41d *7/04, 11/04*
U.S. Cl. 89—13 R 7 Claims



In an automatic cannon comprising a chambered drum driven in either direction through a Geneva movement for successively indexing the chambers at feeding and firing positions, such Geneva movement including a continuously rotated crank wheel and an intermittently rotated star wheel connected to the drum, a firing mechanism includes a firing pin normally biased from a retracted to a striking position and mounting a sear normally biased thereon from a retracted to a latching position for releasably holding the firing pin cocked. A trigger assembly includes a sleeve telescopically mounted to the firing pin and a cam lobe contactable by the cam lobe on the crank wheel for converting rotation thereof to translational displacement of the sleeve for compressing the firing pin spring and acting against the sear for displacement thereof to release the firing pin when rotation of the drum is stopped to index each of the chambers therein at the firing station. The cam lobes on the crank wheel and in the trigger assembly are symmetrically designed to permit smooth camming contact therebetween when the drum is driven in either direction.

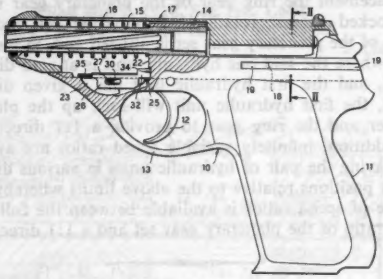
3,620,125
FIXED-BARREL AUTOMATIC PISTOL HAVING A STOPPING DEVICE FOR THE CARRIAGE

Pier Carlo Beretta, Gardone Val Trompia, Italy, assignor to P. Beretta-Armi-Roma S.p.A., Rome, Italy

Filed Apr. 21, 1970, Ser. No. 30,383
Int. Cl. F41d *11/00*
U.S. Cl. 89—196 4 Claims

A stopping device for the bolt and carriage assembly of a fixed-barrel automatic pistol is disclosed, in which latching means are provided to prevent the accidental disassembly of the automatic pistol when this is fired. Due to the presence of a latch which can be rotated about a fixed pin, a manipulation is necessary, and cannot be dis-

pensed with, for separating the carriage and bolt assembly from the pistol frame. The disengagement of the carriage



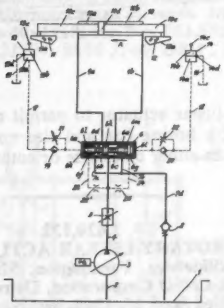
and bolt from the frame can never occur, even in the presence of the usual shocks due to firing.

3,620,126

HYDRAULIC REVERSING SYSTEM FOR A RECIPROCATING WORKING MEMBER

Paul Fuhrimann, Romanshorn, Switzerland, assignor to Hydrel AG Maschinenfabrik, Romanshorn, Switzerland

Filed June 4, 1969, Ser. No. 830,261
Claims priority, application Switzerland, June 19, 1968, 9,462/68
Int. Cl. F01l *25/02*
U.S. Cl. 91—280 **6 Claims**



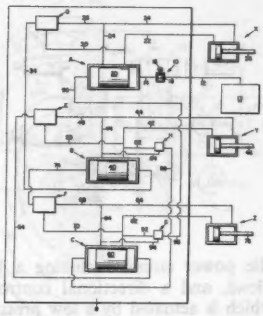
A hydraulic reversing system for a reciprocating working member which is connected with a power cylinder receiving a main piston which subdivides the cylinder into displacement chambers. The main control valve comprises a piston with a central spool separating two working chambers from one another the working chambers being connected to the displacement chambers of the main cylinder. In addition, a pair of control spools separate the main chambers of the valve from control chambers which are respectively connected to hydraulic impulse transmitters cooperating with the movable member for alternate operation on reciprocation thereof. Immediately upon tripping of one of the impulse generators, an oil flow from the main valve inlet to the corresponding control compartment is terminated and the spool valve shifted in the opposite direction to reverse the flow of fluid to the displacement compartments of the main cylinder. After an initial clearance is formed in communication with the control chamber, the main hydraulic pressure serves to bias the control valve.

3,620,127

SEQUENTIAL PULSING SYSTEM

Kenneth R. Blaisdell, 17 Savoy Ave., East Longmeadow, Mass. 01028

Filed Nov. 17, 1969, Ser. No. 877,245
Int. Cl. F15b *11/22, 21/02*
U.S. Cl. 91—412 **1 Claim**



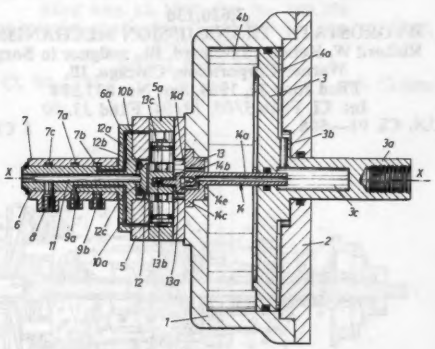
A system of programming a sequential series of mechanism-actuated operations independent of any external timing or switching or limiting valve means.

3,620,128

ROTATING DOUBLE ACTING CHUCK CYLINDER FOR MACHINE TOOLS

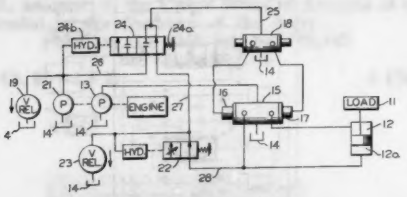
Günter Heckmann, Sprockhovel, Germany, assignor to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Filed Oct. 8, 1969, Ser. No. 864,589
Int. Cl. F15b *11/08, 13/042*
U.S. Cl. 91—446 **12 Claims**



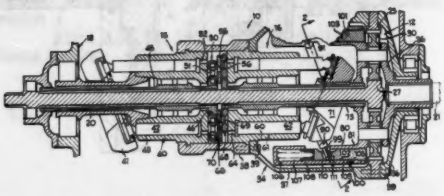
A chuck actuating device having a body with a cylindrical cavity and a double acting piston in the cavity. A main compressed air passage supplies air to the body through a rotary fluid connector and a four-way valve in the body controls the supply of compressed air to the opposite sides of the pistons. The valve is shiftable by fluid pressure supplied thereto via control passages also extending into the body through said rotary fluid connector. A resilient sealing ring check valve is interposed in the main air passage upstream of said four-way valve.

3,620,129
HYDRAULIC POWER CIRCUIT WITH EMERGENCY LOWERING PROVISIONS
Waldo G. Fruehauf, Kalamazoo, Mich., assignor to General Signal Corporation
Filed July 15, 1970, Ser. No. 55,028
Int. Cl. F15b *11/08, 15/18*
U.S. Cl. 91—449 **3 Claims**



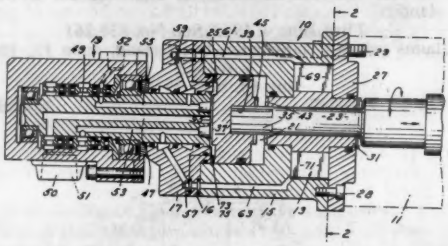
Hydraulic power circuit including a lift cylinder for raising a load, and a directional control valve for the cylinder which is actuated by a low pressure remote control system. The remote control system normally receives motive fluid from a pump, but, when the pump is disabled or idle, the controls may be adjusted to effect lowering of an elevated load utilizing the fluid under load pressure in the cylinder. For this purpose, the circuit includes a switch valve which alternately connects the inlet conduit of the remote control system with the pump or the cylinder depending upon whether pump output pressure is above or below a predetermined value, and a pressure regulator for reducing the pressure of the fluid delivered to the remote control system from the cylinder. In applications where the power pump for the cylinder serves also as the normal source of motive fluid for the remote control system, the pressure regulator may be arranged between the switch valve and the remote control system so that it can serve to reduce the pressure of the fluid supplied to that system from either the power pump or the lift cylinder.

3,620,130
HYDROSTATIC TRANSMISSION MECHANISM
Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed June 30, 1969, Ser. No. 837,594
Int. Cl. F01b *3/00, 13/04;* **F16d** *33/00*
U.S. Cl. 91—506 **1 Claim**



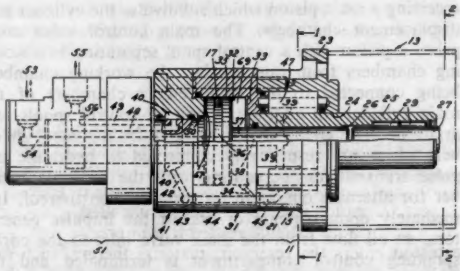
A combined mechanical and hydrostatic transmission having the sun gear of the planetary gear set driven by the input shaft the carrier of the planetary gear set driving the output shaft and a pair of hydraulic units, one of which has relatively rotating elements connected to two of the planetary gear set elements, namely, the planetary carrier and the ring gear, the other hydraulic unit being in fluid communication with the first hydraulic unit and being connected between the fixed element of the case and the ring gear. Both hydraulic units have variable displacement whereby with one of said hydraulic units being at a given displacement, and the other hydraulic unit at zero displacement the ring gear of the planetary gear set will be locked against rotation whereby the full reduction ratio of the planetary gear set is utilized and, in the situation where the said one hydraulic unit is at zero displacement, and the first hydraulic unit has a given displacement, the first hydraulic unit will lock up the planetary carrier and the ring gear to provide a 1:1 direct drive. In addition, infinitely variable speed ratios are available by having the pair of hydraulic units in various displacement positions relative to the above limits whereby a full range of speed ratios is available between the full reduction ratio of the planetary gear set and a 1:1 direct drive.

3,620,131
ROTARY-LINEAR DUAL-DIRECTIONAL ROTATING ACTUATOR
Joseph Nitkiewicz, Farmington, and Nathan Mendelsohn, Oak Park, Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.
Filed Dec. 4, 1969, Ser. No. 881,973
Int. Cl. F01b *21/00*
U.S. Cl. 92—2 **1 Claim**



A rotary-linear actuator to permit retraction of a cutting tool in a boring bar and size compensation of the cutting tool in either clockwise or counterclockwise direction.

3,620,132
ROTARY-LINEAR ACTUATOR
Joseph Nitkiewicz, Farmington, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.
Filed Sept. 25, 1969, Ser. No. 861,109
Int. Cl. F01b *21/00*
U.S. Cl. 92—2 **1 Claim**

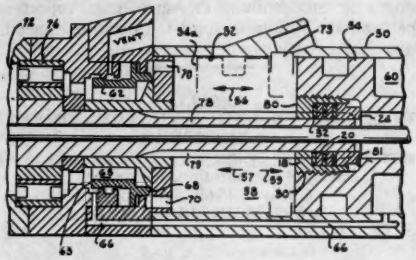


A rotary-linear actuator to permit retraction and size compensation of a cutting tool.

3,620,133
HEAT DISSIPATING BEARING WITH WEAR COMPENSATING MEANS

Jacob E. Feucht, Sidney, Ohio, assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Jan. 9, 1970, Ser. No. 1,608
Int. Cl. F01b 3/06; F16c 31/00, 37/00
U.S. Cl. 92—33 1 Claim

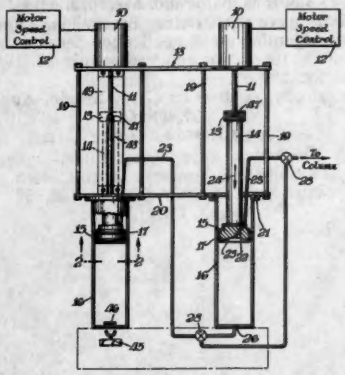


A bushing type shaft bearing for use in the piston of a percussion drill comprising spaced plastic bearing elements disposed in slots in a metallic heat conductive retainer. The retainer dissipates frictional heat developed in the plastic, and also reinforces the plastic against warpage, deformation or cold flow out of the slots. The retainer being threaded into the piston so that an endmost element forcibly abuts against a piston surface to apply an axial squeezing force on the trapped elements.

3,620,134
MATERIAL TRANSPORT SYSTEM

Ralph D. Conlon, Wilmington, and William M. Fleisher IV, Harmony Hills, Newark, Del., assignors to Nester & Faust Manufacturing Corp., Newark, Del.

Filed Sept. 30, 1968, Ser. No. 763,632
Int. Cl. F15b 21/04; B67d 5/46; G01f 11/02
U.S. Cl. 92—79 3 Claims

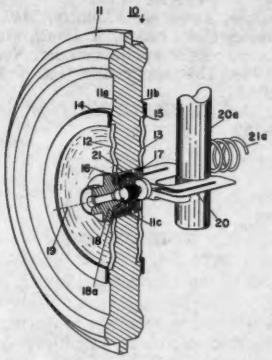


This invention provides a positive displacement apparatus that allows one to repeat automatically in a precise manner the eluting or transporting of material from a reservoir, such as a column, to a second column or a second reservoir. A motor is driven, under controlled speed, to drive a piston into the first reservoir at a precise rate. As the piston enters the reservoir, material therein, such as a liquid, is forced upwardly through an aperture in the piston which co-acts with a tubular element connected to the second reservoir. Preferably, the bottom of the piston is concave and the passageway through the piston head begins at the apex of the concavity.

3,620,135
DIFFERENTIAL PRESSURE CAPSULE WITH TEMPERATURE COMPENSATION

Hoel L. Bowditch, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 7, 1969, Ser. No. 797,545
Int. Cl. F16j 3/00
U.S. Cl. 92—97 5 Claims

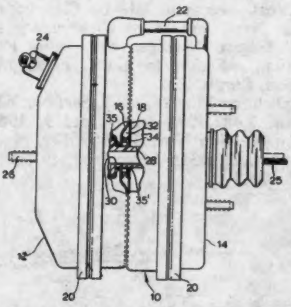


In a motion balance capsule for measurement of differential pressures in process applications, a pair of matched diaphragms each exhibiting a similar change in effective area with stroke are employed to compensate temperature effects; the diaphragms are set to a stroke yielding equal effective areas for no differential pressure; with the application of pressure, and with a temperature change affecting fill volume, the fill will act upon the difference in effective areas of the stroked diaphragms to produce a tendency to off-set the temperature effect upon the spring rate of the capsule assembly, including the motion balance spring.

3,620,136
FLUID SEALS

Charles Brian Weatherhogg, Birmingham, England, assignor to Girling Limited, Birmingham, England

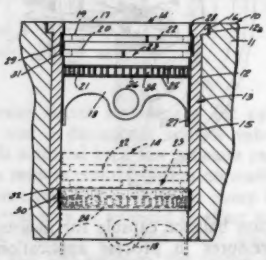
Filed Aug. 13, 1969, Ser. No. 849,756
Claims priority, application Great Britain, Aug. 21, 1968, 39,974/68
Int. Cl. F01b 7/00
U.S. Cl. 92—151 5 Claims



A tandem servo motor housing is provided which comprises a pair of separate cells having end walls which are secured together to form a composite unit, the end walls constituting a partition dividing the interior of the composite housing into two separate chambers. The end walls have portions which are spaced slightly from one another to define an axially situated and generally annular space serving to receive an annular fluid seal. The

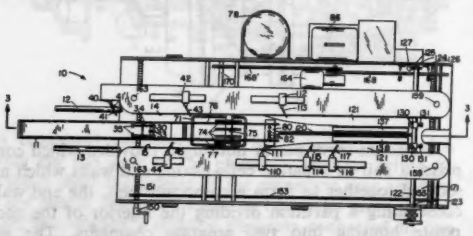
fluid seal preferably comprises an annular body portion, a pair of axially spaced and generally radially directed lips located adjacent the periphery of said body portion, and a radially inner and generally axially directed lip which defines the inner margin of the body portion.

3,620,137
PISTON SLEEVE
Herbert F. Prasse, Town and Country, Mo., assignor to Ramsey Corporation, St. Louis, Mo.
Continuation-in-part of application Ser. No. 696,647, Jan. 9, 1968. This application Oct. 6, 1969, Ser. No. 868,966
Int. Cl. F16j *11/02, 11/04*
U.S. Cl. 92—169 **9 Claims**



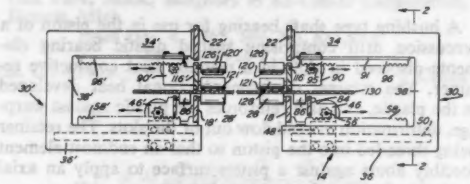
A piston cylinder, particularly an internal combustion engine cylinder liner sleeve, having a band of hard-facing metal such as molybdenum, refractory metal carbide alloys, preferably tungsten carbide, or the like, embedded in the inner surface of the sleeve to provide a corrosion and wear resisting bearing face around the piston rings at the top end of the piston stroke and, if desired, also at the bottom end of the piston stroke. The hard-facing metal band preferably surrounds the top ring of the piston at the top end of the piston stroke. If a hard-facing metal band is provided at the bottom of the piston stroke, it is located to surround the bottom oil ring of the piston at the bottom of the piston stroke. The band is applied by a plasma arc flame spray and has a total porosity level and pore size range able to retain lubricant without retaining grit of a size which would damage the sleeve or piston rings.

3,620,138
METHOD OF CARTON SEALING
Morris P. Neal, deceased, late of Clearwater, Fla., by James L. Neal, executor, Clearwater, Donald G. Reichert, Tarpon Springs, and John Fradenburgh, Tampa, Fla., assignors to A-B-C Packaging Machine Corporation, Largo, Fla.
Original application May 24, 1967, Ser. No. 641,033, now Patent No. 3,482,489, dated Dec. 9, 1969. Divided and this application Nov. 3, 1969, Ser. No. 873,495
Int. Cl. B31b *1/26, 1/62, 49/02*
U.S. Cl. 93—36.3 **3 Claims**



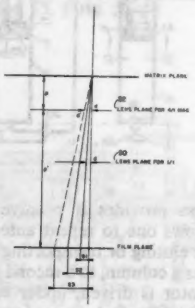
A machine is provided which seals the bottom flaps of empty cardboard cartons. It comprises means to receive partially set up cartons, means to first apply melted thermoplastic polymeric resinous adhesive (known normally as "hot melt" adhesive) to close forward and rear lower flaps, means to then apply water soluble adhesive to other areas of the same flaps, means to then close the side lower flaps against the flaps to which adhesive has been applied, means to square the carton prior to applying pressure, and means to apply pressure from above through the interior of the carton against the bottom of the carton comprising said flaps while at the same time supporting said flaps from the bottom to resist the pressure applied from above.

3,620,139
FOLDER-GLUER AND AUXILIARY CONVEYORS THEREFOR
Henry E. Kulwicki, Willingboro, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed May 5, 1969, Ser. No. 821,625
Int. Cl. B31b *1/04, 1/36, 3/26*
U.S. Cl. 93—50 **4 Claims**



A machine for processing paperboard blanks such as a folder-gluer is provided with auxiliary feed conveyors at the inlet end of the machine. The auxiliary conveyors are movable toward and away from each other so that the area of contact between the auxiliary conveyors and the paperboard blanks may be varied.

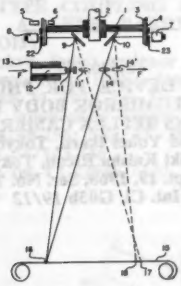
3,620,140
PHOTOGRAPHIC TYPE COMPOSING MACHINE
Louis M. Moyroud, Medford, Mass.
(202 Grove Way, Delray Beach, Fla. 33444)
Continuation-in-part of application Ser. No. 506,936, Nov. 9, 1965. This application July 22, 1969, Ser. No. 843,297
Claims priority, application Great Britain, Aug. 6, 1968, 37,488/68
Int. Cl. B41b *15/34, 17/14*
U.S. Cl. 95—4.5 **7 Claims**



A system for rapidly imaging characters having different relative widths of a radiation-sensitive surface using the concept of optical leverage is disclosed. Character images are projected from one or more projection zones on a character matrix to a receiving surface such as a

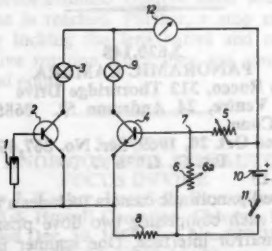
film. Prior to being focused on the film, each of the projected character images are variably spaced from one another in accordance with their respective relative widths in order to form lines of composition having proportionately spaced characters. The focusing system normally includes a size-changing mechanism. Character spacing may be accomplished by any of several embodiments which employ the optical leverage concept. One embodiment comprises at least one movable right-angle prism which is associated with a fixed, rotating character matrix—the prism spaces projected images of selected characters on the film by straight-line movement in a plane parallel to the film plane.

3,620,141
PHOTOGRAPHIC TYPE COMPOSING MACHINE
Louis M. Moyroud, Medford, Mass.
(202 Grove Way, Delray Beach, Fla. 33444)
Filed July 22, 1969, Ser. No. 843,298
Claims priority, application Great Britain, July 25, 1968, 35,575/68
Int. Cl. B41b *17/14*
U.S. Cl. 95—4.5 **8 Claims**



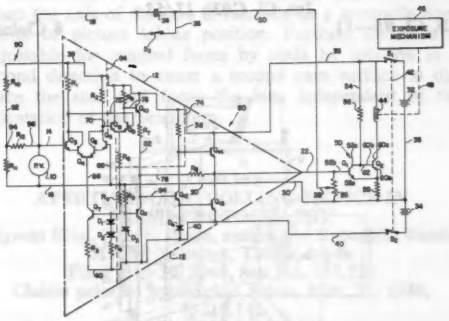
A photocomposing machine is disclosed. A character presentation means, which can be a character bearer such as one or more discs, drums, endless bands, or matrix plates, includes at least two separate character generating stations. Images of selected characters are flash-projected from each station to an associated lens-carriage system which positions proportionately-spaced characters on a film in order to form lines of composition thereon.

3,620,142
ILLUMINATING CONTROL ARRANGEMENT FOR PHOTOGRAPHIC CAMERAS
Dieter Engelsmann, Unterhaching, and Günter Pawlik, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed June 18, 1968, Ser. No. 737,895
Claims priority, application Germany, June 23, 1967, A 56,077
Int. Cl. G03b *7/16*; G01j *1/44*
U.S. Cl. 95—10 C **9 Claims**



An arrangement for adapting flash equipment in photographic cameras to daytime use as well as nighttime conditions. Two transistors have their emitters connected together and are, in turn, connected to a single source of current. The base-emitter path of one transistor includes a light sensor for the purpose of controlling the transistor as a function of the prevailing light conditions. The second transistor includes a variable resistor in its base-emitter path, which is set in accordance with the object distance. This setting of the variable resisor produces control of the diaphragm of a camera to thereby limit the amount of light received by the film from the object to be photographed as a function of the applicable guide number. Each collector of the two transistors includes an indicating lamp in its circuit so as to provide a visual indication of the current or conducting state of a transistor. The combined action of the two transistors is such that as the prevailing light intensity decreases the transistor associated with the variable resistor becomes increasingly conductive.

3,620,143
AUTOMATIC EXPOSURE CONTROL SYSTEM WITH FAST LINEAR RESPONSE
John P. Burgarella, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 16, 1968, Ser. No. 783,855
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 C **13 Claims**

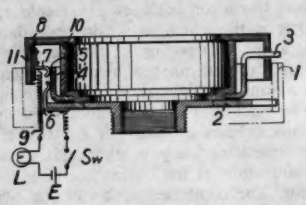


An automatic exposure control system for regulating one or more variable photographic exposure parameters. The light levels of a scene are evaluated using one or more photovoltaic cells. The cells are operated in a current mode through use of an operational amplifier having an input circuit which incorporates a capacitive feedback path. With the system, a highly responsive linear output representative of scene light levels is derived for use in controlling an exposure.

3,620,144
SYSTEM FOR INDICATING THE DISTANCE LIMIT FOR FLASH PHOTOGRAPHY
Toshio Hayashi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Oct. 29, 1969, Ser. No. 870,690
Claims priority, application Japan, Oct. 30, 1968, 43/79,469
Int. Cl. G03b *17/20*
U.S. Cl. 95—11 R **4 Claims**

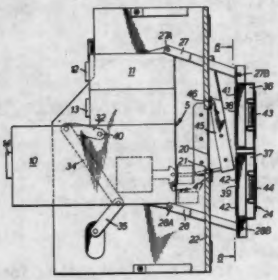
A system for indicating distance limits to flash photography which comprises an electrically conductive surface provided on a guide number changing member of the camera and a contact attached to a distance adjusting member and disposed in mating relationship with the conductive surface. During operation of the guide number changing member and distance adjusting member, the distance between the conductive surface and the contact is

varied. The contact and conductive surface are brought into engagement with each other to close the electric cir-



cuit of an electrical member for indicating a warning when the distance limit of proper exposure for flash photography has been reached.

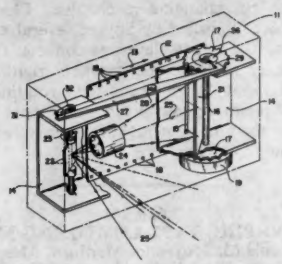
3,620,145
FILM SUPPORT WITH INTERCHANGEABLE CAMERA MEANS
Charles W. Clark, Kings Grove, Maidenhead, Berkshire, England
Filed Nov. 19, 1968, Ser. No. 776,871
Claims priority, application Great Britain, Nov. 20, 1967, 52,748/67
Int. Cl. G03b *17/53*
U.S. Cl. 95—11 **8 Claims**



Photographic apparatus including a single support arranged to locate and support a sheet of photo-sensitive material in a light-tight manner in an exposure position and two cameras adjacent to one another. A guide is provided for moving the cameras and the support relative to one another between positions in which the support is behind one or other of the cameras. The guide is constructed so that the initial and terminal relative movements between the cameras and the support means are generally parallel with the axes of the cameras.

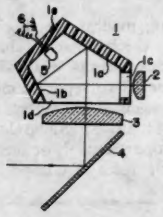
3,620,146
COMPACT SCANNING CAMERA
Jasper S. Chandler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 15, 1970, Ser. No. 46,051
Int. Cl. G03b *37/00*
U.S. Cl. 95—15 **7 Claims**

A compact camera using film of relatively large image format is provided with a scanning mirror or the equivalent and with a relatively long focal length multiple element lens, the first principal point of which is located at or near the scanning pivot axis of the scanning mirror. This arrangement prevents or substantially corrects image smearing caused by the apparent shifting of the lens viewpoint during scanning of the photographed scene and



also reduces other types of distortion inherent in scanning cameras of equivalent size by increasing the focal length of the optical system.

3,620,147
PHOTOMETRIC DEVICE FOR PHOTOMETERING WITHIN A POLOMIRROR BODY FOR USE WITH A SINGLE-LENS REFLEX CAMERA
Hisanori Ataka and Yohei Ikezu, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Sept. 19, 1968, Ser. No. 760,865
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **6 Claims**

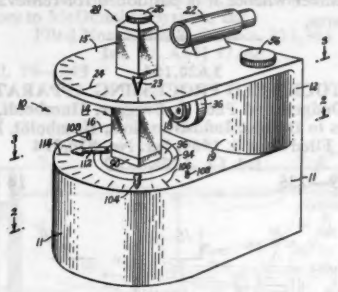


An exposure meter device for use with a single-lens reflex camera wherein the viewfinder system includes a polomirror body (hollow polyhedron formed of plastic material or the like and provided with internal light reflecting surfaces), and a light receiving member is located within or movable into the polomirror and positioned in the optical path of the viewfinder.

3,620,148
PANORAMIC CAMERA
Samuel S. La Rocco, 312 Thornridge Drive 06903, and Daniel B. Ventre, 24 Anderson St. 06851, both of Stamford, Conn.
Filed Oct. 20, 1969, Ser. No. 867,468
Int. Cl. G03b *37/00*
U.S. Cl. 95—15 **15 Claims**

The disclosed panoramic camera includes a pair of optical scanners, each comprising two dove prisms back-to-back with a mirror interface. One scanner is associated with a viewfinder for determining the angle of the desired field of view, which angle may approach 300°. The other scanner is associated with the camera objective lens and is

rotated in synchronism with the advance of film to scan the field of view. Physical stops are provided for adjustably



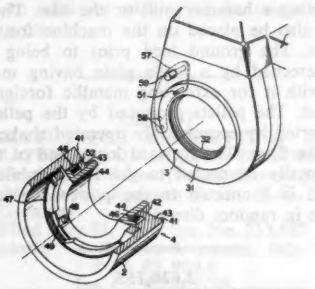
establishing the starting and terminating points of the scan as determined by the viewfinder scanner.

3,620,149

THREADED TYPE COUPLING DEVICE FOR COUPLING A LENS BARREL WITH A CAMERA BODY

Akira Ogihara, Tokyo, Japan, assignor to Olygin Optical Corporation, Tokyo, Japan

Filed July 31, 1970, Ser. No. 60,077
Claims priority, application Japan, Aug. 4, 1969, 44/61,207, 44/88,256; Aug. 18, 1969, 44/64,844; Dec. 28, 1969, 44/123,736
Int. Cl. G03b *3/00*
U.S. Cl. 95—44 R **6 Claims**



In a threaded type coupling device for coupling a lens barrel with a camera body, either of the lens barrel and camera body is provided with an independent threaded cylindrical member contained therein to be movable axially but not in the circumferential direction, and the independent threaded cylindrical member is resiliently urged back from the other of the lens barrel and camera body so as to cause them to abut on each other a little before the predetermined relative axial and circumferential position is reached. Further, a stop mechanism is provided for locking the lens barrel and camera body against relative rotation when they are coupled at said predetermined point.

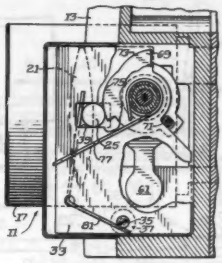
3,620,150

SINGLE KNOB CONTROL SEMIAUTOMATIC FOCUS DEVICE

Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 30, 1969, Ser. No. 889,214
Int. Cl. G03b *13/20*
U.S. Cl. 95—44 C **7 Claims**

This disclosure describes a single knob control semiautomatic focusing device for use on a camera. A cam attached to the knob impinges on a stud attached to the sliding lens sleeve of the camera. The stud is spring biased toward the cam. A free swinging pendulum having a cam surface is mounted so that the cam surface also impinges on the stud. Focus is achieved by rotating the knob in a first direction so that the cam moves the stud away from the cam surface of the pendulum (moves the attached lens sleeve through focus). The axis of the lens is then pointed toward the base of a remote object being focused on and



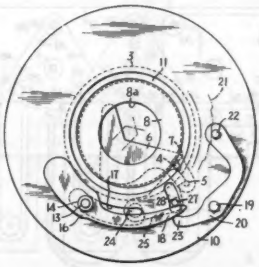
the knob is released so that the stud moves to where it impinges on the cam surface of the pendulum. The stud is maintained in this "focus" position due to friction when the axis of the lens is returned to a generally horizontal or picture taking position. Further, the knob is adjustable for manual focus by scale by rotation in a second direction to cause a second cam surface to displace the stud and focus the lens independent of the orientation of the pendulum.

3,620,151

APERTURE CONTROLLING DEVICE IN FLASH PHOTOGRAPHY

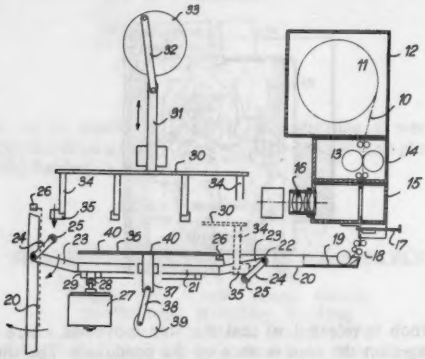
Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed Dec. 30, 1968, Ser. No. 787,726
Claims priority, application Japan, Mar. 21, 1968, 43/18,148
Int. Cl. G03b *7/16, 9/06*
U.S. Cl. 95—64 A **5 Claims**



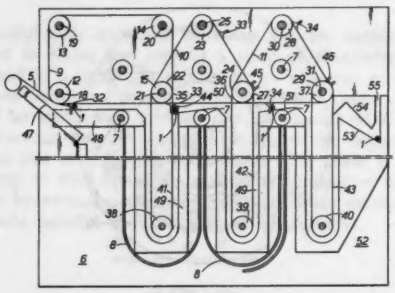
Apparatus for adjusting the exposure aperture for a camera in conjunction with the flash operation thereof, the apparatus including a manually operated device and a control lever responsive thereto, a movable lever responsive to the focusing mechanism and an exposure aperture adjusting member. The exposure aperture adjusting member is moved automatically to adjust the exposure aperture to the proper value for taking a picture utilizing associated flash equipment in response to the guide number set by the guide number setting device and the distance value set by the focusing mechanism.

3,620,152
AUTOMATIC PHOTOGRAPHIC DEVELOPMENT APPARATUS
Claude Daury, Le Pecq, Yvelines, France, assignor to Societe Anonyme dite: Solephot, Levallois-Perret, Hauts-de-Seine, France
Filed Dec. 5, 1969, Ser. No. 882,428
Claims priority, application France, Dec. 19, 1968, 179,189
Int. Cl. G03d 3/10
U.S. Cl. 95—89 R 15 Claims



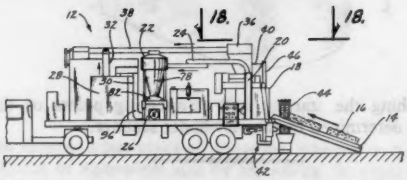
Automatic apparatus for the development of exposed cut strips of photographic film, which comprises a turntable carrying a series of dishes, the complete treatment cycle being performed in each dish for a same exposed cut strip by using small amounts of liquids which are rejected after each operation, until the fully processed strip is delivered to the user of the apparatus.

3,620,153
APPARATUS FOR AUTOMATICALLY PROCESSING PHOTOGRAPHIC FILM OR PAPER
Arnold Reginald Kennington, Ealing, London, England, assignor to Donka N.V., Breda, Netherlands
Filed May 7, 1969, Ser. No. 822,404
Claims priority, application Great Britain, May 8, 1968, 21,703/68
Int. Cl. G03d 3/12
U.S. Cl. 95—94 R 3 Claims



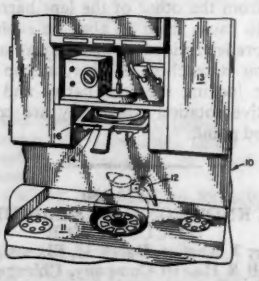
This invention provides apparatus for processing photographic film or papers in succession. A film or paper to be processed is releasably attached to a rod which is transported by an endless belt to a fork on another endless belt which fork conveys the rod with the film or paper trailing behind it through a first processing tank. After passing through the first tank, the rod together with the film or paper is transported by another endless belt to a fork on another endless belt which conveys the rod and film or paper through a second processing tank. In a similar manner, the rod and film or paper is transported for processing in a next tank. Finally, the processed film or paper is passed through a drying chamber whence it is positioned for removal from the apparatus.

3,620,154
LIVESTOCK FEED PROCESSING APPARATUS
John N. Dodgen and Paul C. Swigger, Humboldt, Iowa, assignors to Dodgen Industries, Inc., Humboldt, Iowa
Filed June 3, 1969, Ser. No. 830,014
Int. Cl. A23k 1/20
U.S. Cl. 99—235 14 Claims



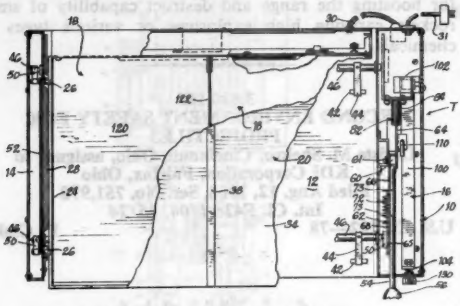
Apparatus for processing animal feed involving a chopper unit in a wagon being fed hay by a conveyor wherein the hay is under compression from a powered roller coordinated in its speed with the speed of the chopper unit. The chopper unit involves one or more rotatable units having blades around its periphery which cooperate with stationary blades in cutting the feed material. One or more pairs of chopper rollers may be provided which turn towards the chopper unit inlet and cooperate with adjacent stationary blades. The material from the wagon may be fed from the chopper unit directly into an apparatus for producing livestock feed pellets having a hammer mill or the like. The chopper unit may also be placed on the machine for producing the pellets. The ground feed prior to being pelletized may be screened by a baffle plate having magnets associated with it for extracting metallic foreign material in the feed. The pellets produced by the pelletizer unit may be sorted by eccentrically operated shaker to separate out the fines. The forward lower end of the shaker being pivotally connected to the frame while the rear raised end is connected to the powered eccentric and may move in random directions.

3,620,155
COFFEE BREWING APPARATUS
George Bixby, Jr., Scottsdale, Ariz., assignor to Automatic Marketing Industries, Inc., Phoenix, Ariz.
Continuation-in-part of application Ser. No. 771,136, Oct. 28, 1968, now Patent No. 3,511,166. This application Apr. 22, 1970, Ser. No. 30,877
Int. Cl. A47j 31/14
U.S. Cl. 99—295 7 Claims



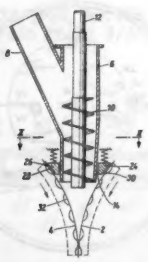
Coffee brewing apparatus using a filter bag wherein a movable pressure plate confines the bag within an open-topped tray to insure thorough distribution of hot water through the grounds in the filter bag.

3,620,156
BUN TOASTER
James C. Schindler, Naperville, Ralph E. Weimer, Lombard, and Ronald M. Herbert, Hanover Park, Ill., assignors to McDonald's System, Inc.
Filed Nov. 3, 1969, Ser. No. 873,304
Int. Cl. A47j 37/68
U.S. Cl. 99—349 5 Claims



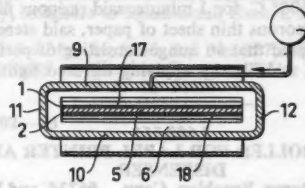
A toaster having a horizontal toasting platen and a parallel pressure face resiliently biasing an object to be toasted against the platen during a toasting cycle to compensate for normally encountered shrinkage of the object from the platen during a toasting cycle. A parallel linkage mounts the pressure face to provide movement perpendicular to the platen and some movement parallel to the platen to minimize sticking of the toasted object to the toasting platen.

3,620,157
APPARATUS FOR BRIQUETTING BULK MATERIALS ON ROLLER PRESSES
Hartmut Rieschel, Hattingen (Ruhr), Germany, assignor to Maschinenfabrik Koppern & Co. K.G., Hattingen (Ruhr), Germany
Filed May 31, 1968, Ser. No. 733,587
Claims priority, application Germany, July 2, 1967, P 16 83 904.6
Int. Cl. B30b 3/00
U.S. Cl. 100—145 9 Claims



Apparatus for briquetting loose material on roller presses by the use of pre-compression in a charging hopper whereby the bulk material which has a grain size predominantly smaller than 40μ is continuously compressed at a predetermined ratio to such an extent that its bulk density reaches approximately 50% of the specific weight.

3,620,158
CONTINUOUS PRESS
Aldo Torelli and André Jacquemet, Grand-Lancy, Geneva, Switzerland, assignors to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden
Filed July 11, 1969, Ser. No. 840,928
Claims priority, application Switzerland, July 12, 1968, 10,473/68
Int. Cl. B30b 5/04
U.S. Cl. 100—154 2 Claims



A continuous press comprises two conveyor belts serving to press and convey between them a product in the shape of a plate or the like and to subject said product to a hydraulic or pneumatic pressure, in which the two adjacent flights of the belts pass through a pressure chamber that surrounds said flights in the transverse direction, said chamber having one entering opening and one exit opening for the said flights.

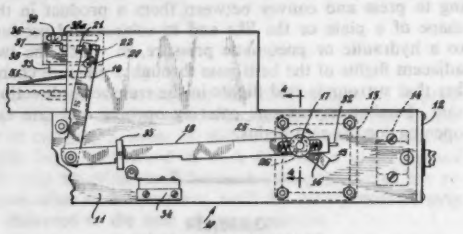
3,620,159
MARKING HAMMER
James L. Gould, Rte. 2, Box 566, Tillamook, Oreg. 97141
Filed July 24, 1969, Ser. No. 844,511
Int. Cl. B44b 5/02
U.S. Cl. 101—28 6 Claims

This invention relates to a marking hammer used to brand logs at their ends by making an intaglio recess to indicate ownership and where they were cut. Trees are frequently felled in difficult territory in which to swing a hammer. This hammer has sufficient mass and articulation to ensure that the stencil on the hammerhead will tilt and indent squarely on the end of a log. The point of articulation is protected by a resilient and elastic sheathing that holds the hammerhead square to the work when it is swung but permits it to cant if the blow is not made trully normal to the log end.

3,620,160
HEAT-SENSITIVE STENCIL PAPER
Keishi Kubo and Kiyoshi Sakai, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,718
Claims priority, application Japan, Oct. 6, 1967, 42/64,081
Int. Cl. B41n *1/24*
U.S. Cl. 101—128.2 **1 Claim**

A heat-sensitive stencil paper for use in mimeographic printing, comprising a resinous film consisting of a vinylidene chloride-vinyl chloride copolymer which has a biaxial heat shrinking coefficient in the range of the order of 2–8% at 100° C. for 1 minute, said resinous film being lined with a porous thin sheet of paper, said stencil paper being so adapted that an image consisting of perforations is formed in said film by applying infrared light thereto.

3,620,161
CONTROLLER FOR LABEL PRINTER AND DISPENSER
Richard S. Doran, Brooklyn, Conn. 06234, and Knut A. Barstrom, Rte. 87, Columbia, Conn. 06237
Filed July 29, 1969, Ser. No. 845,868
Int. Cl. B41f *1/06*
U.S. Cl. 101—291 **8 Claims**

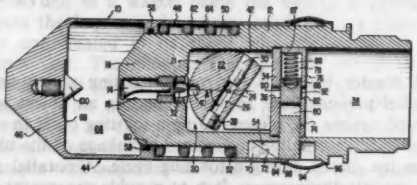


An attachment for controlling the operation of a mechanical apparatus that oscillates about an axis in performing its work function. In particular the attachment will control the operation of a formerly manually operated label printing and dispensing apparatus of the type used by supermarkets and the like for printing price labels to be attached to merchandise. The pressure adhesive labels are furnished attached to a web or continuous belt. Each label is printed and delivered by the printer-dispenser to the hand of the operator who then applies it to the merchandise. The attachment enables the operator to receive the printed label as it is removed by the web ready to be applied to the merchandise at a rate of speed controlled to the operator's reaction timing as he picks up the delivered label. The attachment controls the pressure of the printing head on the label and the inking pad. An embodiment of the attachment provides for continuous rolling up of the web after the labels have been printed instead of being dispensed individually from the web, in order to store the labels for subsequent use.

3,620,162
RIFLE LAUNCHED ROCKET
Paul C. King, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Sept. 30, 1969, Ser. No. 862,201
Int. Cl. F42b *11/42, 13/28*
U.S. Cl. 102—65.2 **3 Claims**

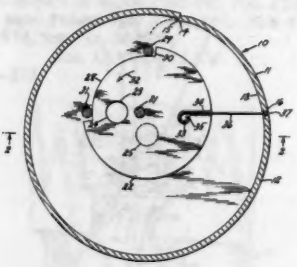
A rifle launched rocket which comprises a rocket motor provided with a bullet catcher and a warhead with a fuse assembly and means for attachment of the rocket to the muzzle of a field rifle. In operation when the rifle is fired the combination of the bullet momentum and the gases from the fired cartridge create sufficient impetus to launch the rocket from the barrel of the rifle. Simultaneously the bullet ignites the rocket motor which propels the rocket to the target at high speed. When the forward end of the rocket which carries the warhead and fuse assembly hits a target, the fuse initiates detonation of the warhead. This device provides a means for boosting the range and destruct capability of small rockets carrying high explosives or various types of chemicals.

3,620,163
SECOND ENVIRONMENT SAFETY FOR PROJECTILES
Christe M. Shekro, Cincinnati, Ohio, assignor to KDI Corporation, Fairfax, Ohio
Filed Aug. 12, 1968, Ser. No. 751,978
Int. Cl. F42c *1/04, 15/24*
U.S. Cl. 102—78 **17 Claims**



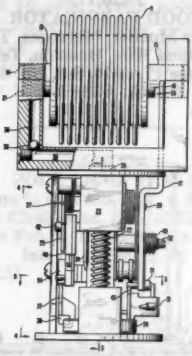
A low mass element carried by a projectile and responsive to aerodynamic drag for providing a second environment safety to a projectile fusing system which incorporates an integrating accelerometer as a primary safety in arming of the fuse subsequent to projectile firing.

3,620,164
PROJECTILE FUZE SAFE AND ARMING DEVICE
Joseph P. Carroll, 164 Columbia Heights, Brooklyn, N.Y. 11201
Filed May 26, 1969, Ser. No. 827,736
Int. Cl. F42c *15/22, 15/24*
U.S. Cl. 102—78 **3 Claims**



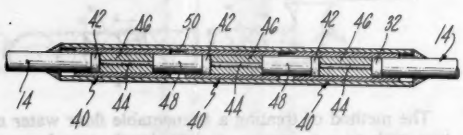
A projectile fuze safe and shell arming device including a fixed member, a weighted rotor movable relative to said fixed member from inactive to active positions, and retarding means exerting a resilient force proportional to the displacement of said rotor from inactive position. Locking means is provided to maintain said rotor in active position once said position is reached.

3,620,165
SELF-COMPENSATING BAROMETRIC FUZE
John E. Henderson, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.
Filed Sept. 10, 1969, Ser. No. 856,543
Int. Cl. F42c 5/02
U.S. Cl. 102—70 B 7 Claims



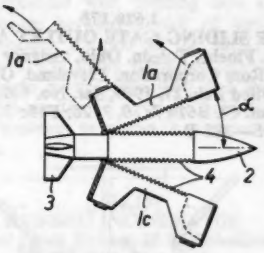
The invention relates to barometric fuzes for high altitude rockets and particularly to a mechanical self-compensating barometric sensing bellows having prior to launch, a fixed end and a free end, the free end designed to compensate for changes in atmospheric pressure. Launch acceleration releases a firing pin which fires a charge driving a plug into a movable shaft attached to the free end of the bellows sensing element. The plug freezes the movement of the shaft and establishes a reference bellows length proportional to the ambient atmospheric pressure immediately upon launch. The fixed end is then released to sense altitude change. A time delay safety subsequently coacts with the barometric sensing bellows to prevent firing as the rocket passes upwardly through the preselected firing altitudes. The safety then releases an altitude sensor at the bellows to trigger fuze ignition on the descent at the preselected altitude.

3,620,166
RADIANT ENERGY SIGNAL TRANSMISSION SYSTEM
Francis H. Bratton, Avon, and John M. Smith, Simsbury, Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.
Filed Dec. 24, 1968, Ser. No. 786,586
Int. Cl. F42b 23/20, 3/18, 3/16
U.S. Cl. 102—70.2 A 8 Claims



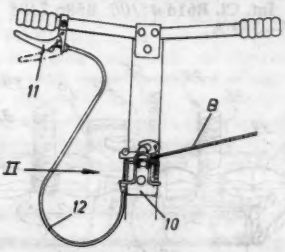
A new and highly practical signal transmission system utilizing a radiant energy signal unaffected by adverse operating conditions provides for the operation of a work function at a work station located remotely from the source of the radiant signal. The system includes the transmission of a noncoherent light signal of high intensity along a light transmitting conduit to a sensitive pyrotechnic or explosive relay device capable of absorbing attenuated light signals and emitting an amplified light signal along additional lengths of conduit to the remotely located work station. The relay device, which may be hermetically sealed, beneficially incorporates a pyrotechnic delay material for accurately controlling and synchronizing the receipt of the signal at a plurality of isolated work stations.

3,620,167
DRIVE CAGE FOR WING-STABILIZED LOW-CALIBER SHELLS
Rudolf Romer, Dusseldorf, Jurgen Winkelmann, Kleinenbroich, and Winfried Rossmann, Neuss-Kaarster Brucke, Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany
Filed May 26, 1969, Ser. No. 827,729
Claims priority, application Germany, May 31, 1968, P 17 03 507.3
Int. Cl. F42b 13/16
U.S. Cl. 102—93 4 Claims



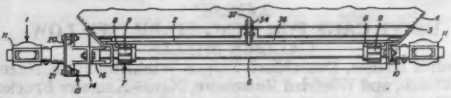
A wing-stabilized low-caliber shell, which comprises a shell body and a drive cage surrounding in the center range the shell body and comprising segments including loosely joined parts. At least one annular guide band holds together the segments. A tail unit is secured to the shell body and the drive cage has an end face opposite the tail unit. A sealing disc is disposed at the end face of the drive cage, and the guide band is disposed adjacent the sealing disc.

3,620,168
DEVICE FOR COUPLING A SKI-BOB TO A SKI LIFT
Henri Rey, Haute-Roche, Crans-Sierre, Switzerland
Filed Dec. 17, 1968, Ser. No. 784,386
Claims priority, application Switzerland, Dec. 19, 1967, 17,910/67
Int. Cl. B61b 11/00
U.S. Cl. 104—202 4 Claims



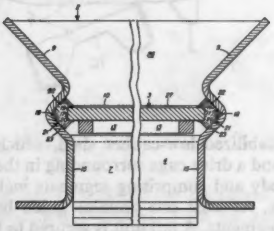
This invention relates to a device for coupling a ski-bob to a ski lift and comprises a hook including a mobile element ensuring the closure of the hook, a spring biased lock for locking the mobile element in closed position and a control member operating, when actuated, on the lock to maintain the lock in a closed position against the action of the biasing spring.

3,620,169
HOPPER GATE POWER DRIVE MECHANISM
Walter L. Floehr, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed July 2, 1969, Ser. No. 838,565
Int. Cl. B61d 7/20, 7/26; F16h 57/02
U.S. Cl. 105—282 7 Claims



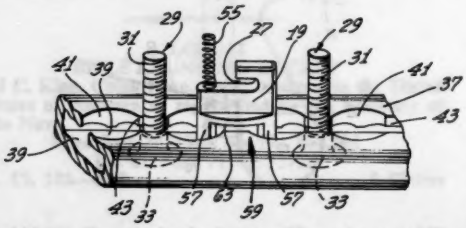
Actuating mechanism having at opposite ends of a drive shaft for a discharge gate, alternatively or simultaneously operable drives, one direct and the other through a housed, bi-directional, hypocycloidal gear train, for selectability of the power applied in operating the gate.

3,620,170
HOPPER SLIDING GATE OUTLET ASSEMBLY
Walter L. Floehr, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Feb. 27, 1969, Ser. No. 802,951
Int. Cl. B61d 7/20, 7/26; F16c 29/00
U.S. Cl. 105—282 P 9 Claims



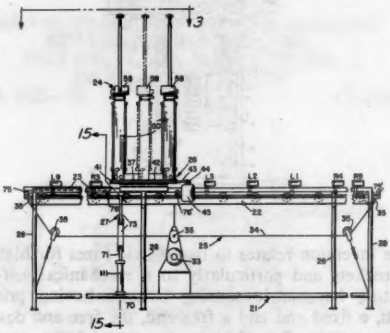
A slide gate assembly for railway hopper cars having wedges on the sides and rear end of the slide gate fitting in inwardly flaring V-grooves indented in the gate frame, and depending for sliding support and guiding of the gate at the sides and sealing at sides and rear on engagement between contacting surfaces of the wedges and the grooves.

3,620,171
RATTLEPROOF TIE-DOWN ASSEMBLY
Paul S. Brenia, Torrance, and Ernest Prete, Jr., Woodland Hills, Calif., assignors to Ancra Corporation, El Segundo, Calif.
Filed Dec. 4, 1969, Ser. No. 881,984
Int. Cl. B61d 45/00; B60p 7/08
U.S. Cl. 105—369 A 13 Claims



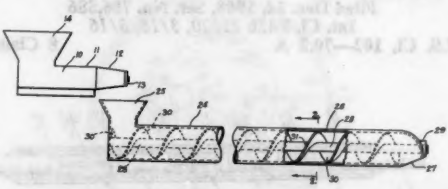
A rattleproof tie-down assembly for use in aircraft and other vehicles comprising a body having a plunger therein which is actuated by an eccentric formed on an operator-controlled handle. The plunger is forced against a fixture by the eccentric so as to tend to force the body away from the fixture and a pair of holding means, mounted on the body, are fitted within the fixture to prevent such a movement of the body. A resilient means is fixed to the plunger for compression against the fixture, or may be mounted between the body and the holding means, so as to prevent the body, holding means, and plunger from vibrating against the fixture.

3,620,172
FOOD FABRICATOR
Foster Mueller, Mercedes, Tex.
(614 Winterwood Way, Houston, Tex. 77029)
Filed June 17, 1970, Ser. No. 46,981
Int. Cl. A23g 3/00
U.S. Cl. 107—1 A 10 Claims



A work receiving board reciprocates below an oscillatable feed turret to receive a ribbon strip of dough and filling in either direction of movement of the board while folding one edge of the dough over the filling prior to tilting of the board during a dwell thereof for rolling the dough into a continuous roll and cutting of the latter into uniform lengths of edibles; the programming of the above operations in timed relation to one another according to variations of the edibles to be produced on the apparatus.

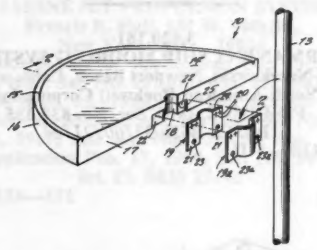
3,620,173
FERMENTABLE FLOUR WATER MIXTURE TREATMENT
George P. Sternberg, 727 W. 46th St., Kansas City, Mo. 64112
Filed Nov. 15, 1967, Ser. No. 683,253
Int. Cl. A21d 8/00
U.S. Cl. 107—54 B 9 Claims



The method of treating a fermentable flour water mixture such as a sponge, a straight dough, or a brew containing flour, used in the manufacture of bakery products, by fermenting the mixture at a higher than atmospheric pressure. In the case of a sponge or straight dough, the ingredients are mixed to blend them while subjected to a continuously increasing pressure, by passing the mixture through a tubular chamber from an inlet at one end to an adjustable size outlet at the other end, the chamber decreasing in cross section toward the outlet end. Positive feed is by a feed screw which mixes by interaction with longitudinal ribs on the inner face of the chamber.

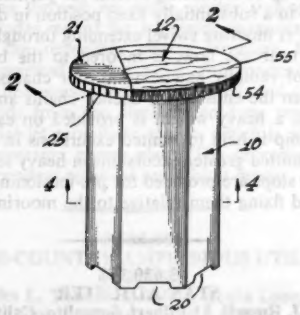
After the mixture has been blended it is fermented under higher than atmospheric pressure for from thirty minutes to two hours by feeding the mixture into one end of an elongated closed vessel, that confines the mixture under pressure while a feed screw advances it toward a discharge outlet, at the other end, the pressure being produced by expansion of the mixture during fermentation. The mixture, if a sponge, may produce two different bakery products that require different ingredient contents, by accumulating it in an open vessel, adding sufficient water thereto to produce a pumpable slurry and selectively pumping the slurry to either of a pair of dough mixers, where the additional amount of flour and other ingredients required to produce the kind of dough desired are added.

3,620,174
POLE LAMP TABLE
Emma L. Dentino, R.R. 1, Box 36, Chillicothe, Ill. 61523
Filed Feb. 9, 1970, Ser. No. 9,844
Int. Cl. A47b *13/02*
U.S. Cl. 108—151 **2 Claims**



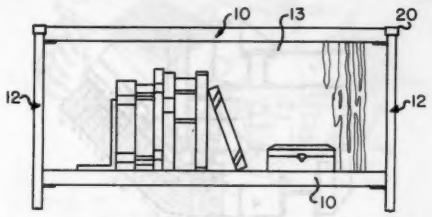
A table securable to a conventional pole lamp, the table comprising two semi-circular panels which may be clamped individually around the pole so to form semi-circular tables, or else clamped together around the pole so to form a circular table.

3,620,175
PAPERBOARD TABLE
Walton B. Crane, Sherman Oaks, and John Hawkinson, Whittier, Calif., assignors to Protective Packaging, Inc., Santa Fe Springs, Calif.
Filed Jan. 14, 1970, Ser. No. 2,808
Int. Cl. A47b *3/06*
U.S. Cl. 108—153 **11 Claims**



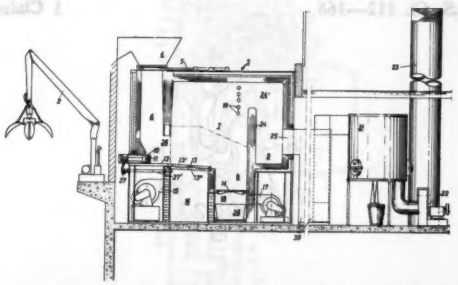
An inexpensive table of novel construction is made from paperboard or other comparable bendable material. This permits fabrication from a few basic parts of an inexpensive table which can be discarded instead of stored after relatively limited use as may be needed at parties, conventions, exhibitions, and the like.

3,620,176
TRIM FASTENINGS FOR SHELVING UNIT
Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, Ill., assignors to The Hirsh Company, Skokie, Ill.
Filed Jan. 26, 1970, Ser. No. 5,558
Int. Cl. A47b *3/06*
U.S. Cl. 108—153 **10 Claims**



Lightweight knockdown steel shelving with box channel edge trim inserts for finishing strips having a reverse inner flange provided with yielding tabs at each end adapted to engage between a pair of upright support members to enclose the end of the support members, retain and cover any panel members therebetween and cover the juncture between the shelf end and the panel. The tabs are so positioned as to be hidden in use, and eliminate any tendency to spread the end walls of the box channel strips.

3,620,177
RUBBISH INCINERATOR
Knud Giede Bøving, 20 Mollebakken, 5594 Strib, Denmark
Filed Nov. 3, 1969, Ser. No. 873,312
Claims priority, application Denmark, Nov. 4, 1968, 5,350/68
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 R **4 Claims**

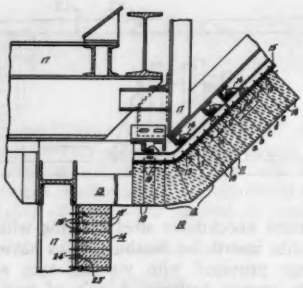


An incinerator for rubbish and the like, in which a substantially box-shaped stoker plunger or pusher extends tight-fitting through the side of a shaft opposite the stoker opening of the fire box at the bottom of the shaft so as to be capable of sliding backwards and forwards along the bottom of the shaft while similar to a plunger pushing the fuel before the end surface of the plunger towards the inlet opening and in on the grate, the height of the plunger being smaller, primarily considerably smaller than the height of the inlet opening of the fire box.

3,620,178
FURNACE REFRACTORY SUPPORTING STRUCTURE
Edwin B. Miller, Sr., Baltimore, Md., assignor to Bethlehem Steel Corporation
Filed June 23, 1970, Ser. No. 49,088
Int. Cl. F23m *5/02*
U.S. Cl. 110—99 B **14 Claims**

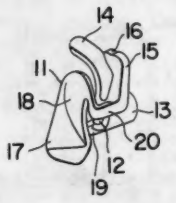
An improved metallurgical furnace construction utilizing specially designed metal plates interposed between

the furnace refractory bricks to secure them to the structural steelwork of the furnace. Each of the plates is secured at one end to the furnace steelwork and at the other end has flanges which extend transversely from opposite faces of the plate. The flanges extending from one face of the plate are spaced a greater distance from



the inner end of the plate than the flanges extending from the opposite face of the plate. Each of the bricks suspended from such plates has a slot extending across two opposite faces of the brick, near its inner end. The slot in one face is spaced a greater distance from the inner end of the brick than the slot in the opposite brick face.

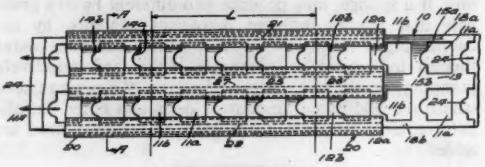
3,620,179
SINGLE THREAD CHAIN STITCH FORMING MEANS FOR USE IN A CONVENTIONAL SEWING MACHINE
Hideki Kuwajima, Tokyo, Japan, assignor to Riccar Sewing Machine Co., Ltd., Tokyo, Japan
Filed Oct. 20, 1969, Ser. No. 867,578
Int. Cl. D05b *1/14*
U.S. Cl. 112—168 **1 Claim**



This invention relates to single thread chain stitch forming means for use with a sewing machine provided with a shuttle mechanism adapted in repetitive operation for forming normal stitches by intertwining upper and lower threads which single thread chain stitch forming means permit the formation of single thread chain stitches with the upper thread alone when the thread chain forming means is mounted on the shuttle hook in place of a conventional bobbin and bobbin case.

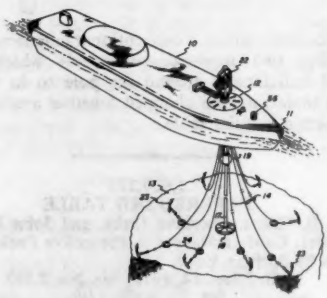
3,620,180
READILY ENGAGEABLE AND DISENGAGEABLE FASTENERS
George Waldes, Plandome, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.
Filed Oct. 20, 1969, Ser. No. 867,597
Int. Cl. A41f *1/00*
U.S. Cl. 112—407 **11 Claims**

An eye tape for a hook-and-eye (or a stud-and-eye) tape-form fastener comprising the assembly of an elongate strip of pliable sheet material, such as thin sheet plastic, having one or more longitudinal rows of eye-like recesses or openings stamped or otherwise formed thereon for the reception of one or more of the hooks of the companion hook tape (or studs of the companion stud tape), on a fabric tape or the like arranged so as to



provide an open-front envelope or carrier for said plastic eye strip. Said plastic eye strip is suitably secured to said fabric tape as by sewing, heat sealing, gluing, etc. A lining strip may be interposed between the plastic eye strip and the underlying portion of the fabric carrier tape.

3,620,181
PERMANENT SHIP MOORING SYSTEM
Bruno R. Naczkowski, Newport Beach, Calif., assignor to North American Rockwell Corporation
Filed July 2, 1969, Ser. No. 838,435
Int. Cl. B63b *35/00, 21/24*
U.S. Cl. 114—.5 D **4 Claims**

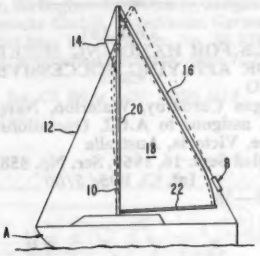


A mooring or anchoring system for permanently locating a ship in a substantially fixed position in deep water is described. A mooring swivel extending through the hull of the ship, near the bow, is moored to the bottom by a plurality of radially extending anchor chains. Intermediate between the ends of the anchor chains and the mooring swivel, a heavy weight is provided on each chain so that the ship is held to limited excursions in normal seas but is permitted greater excursions in heavy seas. A winch and chain stops are provided for pre-tensioning the anchor chains and fixing them relative to the mooring swivel.

3,620,182
STAY ADJUSTER
David J. Russell, 81 Filbert, Sausalito, Calif. 94965
Filed Sept. 25, 1969, Ser. No. 860,932
Int. Cl. B63h *9/04*
U.S. Cl. 114—109 **3 Claims**

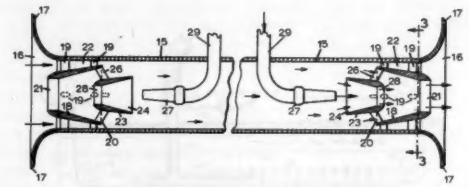
A stay adjuster is provided with a hydraulic cylinder and piston for changing the length of a tensively loaded stay on a sailboat. Once adjustment has occurred, a mechanical lock on the stay mechanism maintains the stay

adjuster in a positively locked position. A pressure gauge communicated to the interior of the hydraulic cylinder



and piston provides an indication of backstay loading during stay adjustment.

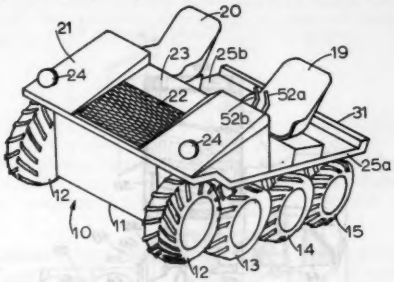
3,620,183
MARINE JET PROPULSION SYSTEM
Francis R. Hull, 140 W. 88th St., New York, N.Y. 10024
Continuation-in-part of applications Ser. No. 701,262, Dec. 6, 1957, Ser. No. 277,071, Apr. 29, 1963, Ser. No. 353,700, Mar. 23, 1964, Ser. No. 492,959 Aug. 27, 1965, Ser. No. 554,614, Apr. 27, 1966, Ser. No. 666,234, Aug. 9, 1967, and Ser. No. 732,476, Apr. 25, 1968. This application Feb. 17, 1969, Ser. No. 814,475
Int. Cl. B63h *25/46*
U.S. Cl. 114—151 **55 Claims**



This invention relates to the propulsion of marine vessels by means of a reversible jet-reaction ejector structure composed in part of oppositely-directed secondary-nozzle ejector stagings whose members are disposed in tandem with respect to each other to act successively on fluids passing through an active ejector staging. The invention includes means for supplying pressurized motive liquids to the reversible ejector structure from fluid pumps, pressurized motive steam for condensing steam jets from saline conversion power plants, and pressurized motive liquids from the displacement-type pressure vessels of a pulse-jet propulsion system which is actuated by a saline conversion power plant. The invention also includes independent pulse-jet propulsion means.

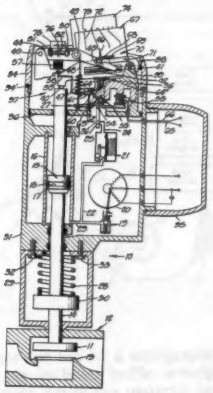
3,620,184
CROSS-COUNTRY AMPHIBIOUS UTILITY VEHICLE
John L. Thousand, 1600 Lincoln Lane, Newport Beach, Calif. 92660
Filed June 9, 1969, Ser. No. 831,661
Int. Cl. B63f *3/00*
U.S. Cl. 115—1 **5 Claims**

A cross-country amphibious vehicle with a flotation hull equipped with a plurality of propulsion wheels at each side on rotatably mounted unsprung wheel spindles. The vehicle drive system from an engine to, ultimately, the propulsion wheels is through a differential to opposite side drives and with a brake on the drive output from each



side of the differential for vehicle steering as individually actuated by the operator and for braking when both are simultaneously actuated.

3,620,185
HYDRAULIC CONTROL SYSTEM
William F. Keller, Covina, and Frank F. Domyan, North Hollywood, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Sept. 8, 1969, Ser. No. 855,937
Int. Cl. F16k *37/00*
U.S. Cl. 116—125 **7 Claims**

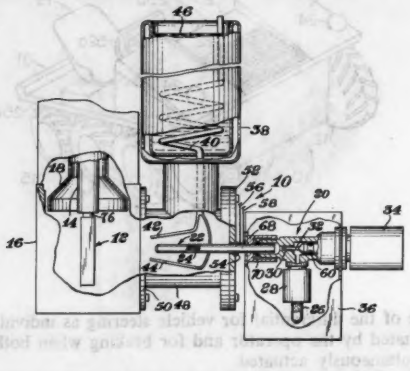


A hydraulic system having calibration, bandwidth, and dash pot controls with indicators for each, and a dash pot adjustment.

3,620,186
INFRARED SPECTROSCOPY APPARATUS
Stanley T. King, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 2, 1969, Ser. No. 881,506
Int. Cl. C23c *11/00*
U.S. Cl. 118—48 **4 Claims**

This invention relates to apparatus for use in isolating monomers of hydrogen-bonded organic compounds, liquids or solids at room temperature in a low temperature inert gas matrix. The apparatus comprises a refrigerated section having an infrared window, a second refrigerated

section for pre-cooling the inert matrix gas and for receiving vaporized material to be deposited on the infrared window, the second section having matrix gas nozzles adjacent to a sample inserting nozzle entering the second section from an adjacent sample heating and valving section. The sample inserting nozzle has internal heating means for maintaining the sample material and the nozzle's internal walls above the temperature at which sample material deposits on the inner wall of the nozzle.



3,620,187

APPARATUS FOR HANDLING SHEET MATERIAL AND FOR APPLYING SUCCESSIVE COATINGS THERETO

Henry Morgan Corderoy, Waterloo, New South Wales, Australia, assignor to A.C.I. Operations Pty. Limited, Melbourne, Victoria, Australia

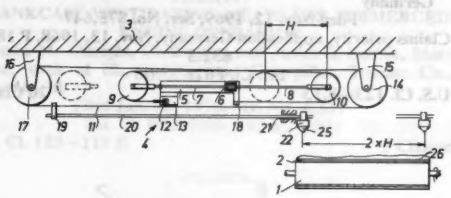
Filed Sept. 16, 1969, Ser. No. 858,482
Int. Cl. B05c *5/00*
U.S. Cl. 118—58 **7 Claims**

This invention relates to apparatus for handling sheet material and for applying thereto successive coatings disposed mutually at right angles.

3,620,188
APPLICATOR AND GANTRY FOR USE WITH CONVEYOR BELTS IN THE MANUFACTURE OF FOAM PLASTIC SECTION MEMBERS

Willi Schmitzer, Birlinghoven, Germany, assignor to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed May 18, 1970, Ser. No. 38,186
Claims priority, application Germany, June 7, 1969, P 19 29 036.9
Int. Cl. B05c *5/00*; B05b *3/18*
U.S. Cl. 118—323 2 Claims

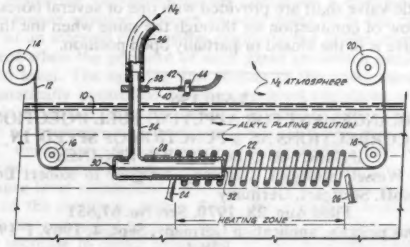


The gantry of a foaming machine is applied with a plug of pulleys backwards and forwards displacement of the applicator for the foam-forming mixture in order to reach a higher speed of the applicator during its movement.

3,620,189
APPARATUS FOR PLATING ALUMINUM ON WIRE

Larry H. Hood; Le Roy Rose, and Charles M. Starks, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 6, 1970, Ser. No. 25,696
Int. Cl. B05c *5/00*
U.S. Cl. 118—620 14 Claims



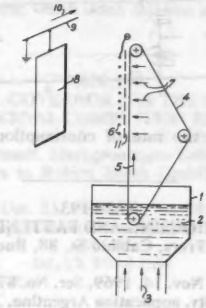
Apparatus for plating an elongated metal member, such as a wire, with a coating of a metal capable of being incorporated in a liquid plating solution. The wire is passed lengthwise through a bath of, for example, an aluminum alkyl liquid. A heating zone is provided in the bath, as by means of an induction coil surrounding a portion of the path of movement of the wire, or by resistance heating of the wire. Means are provided for displacing the aluminum alkyl liquid from around that portion of the wire in the entry end portion of the heating zone, such that the wire will be heated to the desired plating temperature prior to the time the heated wire is exposed to the aluminum alkyl liquid to provide a thick coating of aluminum on the wire in a single pass through the bath.

3,620,190
SPRAYING APPARATUS

Otto Renner, Neu-Isenburg, Germany, assignor to Licentia Patent-Ver waltungs-G.m.b.H, Frankfurt am Main, Germany

Filed May 22, 1969, Ser. No. 826,832
Claims priority, application Germany, Nov. 9, 1968, P 18 08 149.7 May 22, 1968, P 17 52H410.6
Int. Cl. B05b *5/02*
U.S. Cl. 118—630 12 Claims

An apparatus for electrostatically spraying powdery material. A conveyor extends into a vessel which contains a supply of the material to be sprayed, this conveyor moving the material from the vessel to a point near a spraying zone.

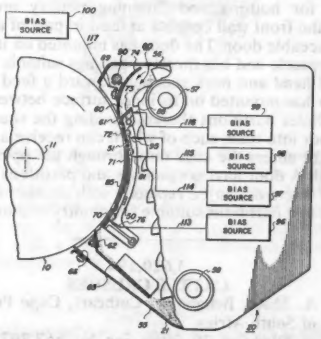


Means are provided for moving the material from this point into the spraying zone.

3,620,191
BIASED INPUT CHUTE

James M. Lyles, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 3, 1969, Ser. No. 838,817
Int. Cl. G03g *13/08*
U.S. Cl. 118—637 7 Claims



An entrance chute for use in a xerographic development system comprising an inclined baffle arranged to direct a flow of two-component developer material into contact with a moving photoconductive surface and a shield positioned between the photoconductor and the inclined baffle, the baffle and shield cooperating to form a restricted opening through which two-component developer material supported therebetween is introduced into the development zone. The baffle and the shield are both electrically biased to establish a strong directional force field in the introductory region for forcing loose toner particles away from the photoconductive surface.

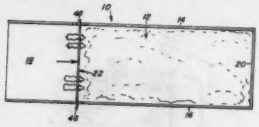
3,620,192
ANIMAL ACTUATED SILO FEEDING GATE

James R. Taylor, R.D. 1, Buffalo Mills, Pa., and Clifford M. Berry, 110 Hillcrest Ave., Manhasset, N.Y.

Filed Mar. 19, 1970, Ser. No. 21,166
Int. Cl. A01k *01/00*
U.S. Cl. 119—16 5 Claims

A feeding silo of the type comprising an enclosure of substantially rectangular configuration having an open end. A

feeding gate is positioned across said opening and is mounted for movement longitudinally through said enclosure at a rate



dependent upon the rate of consumption of the ensilage within the silo.

3,620,193

CAGES FOR HOUSING AND FATTENING POULTRY

Alberto German Frers, Cabildo St. 88, Buenos Aires, Argentina

Filed Nov. 14, 1969, Ser. No. 876,843
Claims priority, application Argentina, July 11, 1969, 222,748
Int. Cl. A01k *39/00, 31/18*
U.S. Cl. 119—18 **5 Claims**

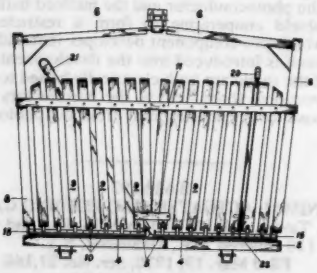
Cages for housing and fattening poultry are disclosed wherein the front wall consists at least in part of an openable and replaceable door. The door has mounted on its exterior a feed receptacle and has therein openings suitable for passage of a fowl head and neck reaching toward a feed receptacle. The door has mounted on its inner surface between adjacent pairs of holes partitions thereby dividing the space adjacent to the door into stalls each of which can receive an individual fowl. Light enters the cage only through the openings in the front wall. A door having openings and partitions suitable for a bird of one size can be replaced with another door having openings and partitions suitable for poultry of another size.

3,620,194

CATTLE CRUSHES

Paul H. A. Miles, Benghoyle, Cathcart, Cape Province, Republic of South Africa

Filed Oct. 20, 1969, Ser. No. 867,707
Claims priority, application South Africa, Oct. 21, 1968, 68/6786
Int. Cl. A61d *03/00*
U.S. Cl. 119—98 **8 Claims**



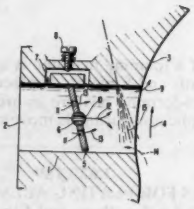
A cattle crush having one wall fixed in relation to the floor thereof and one wall adjustably positionable with respect to the fixed wall, the adjustable wall comprising a series of roughly parallel upwardly extending slats hingedly connected at their lower ends to the crush, the upper portions of the slats being interconnected by a transverse flexible strip.

3,620,195

ROTARY PISTON INJECTION-TYPE INTERNAL COMBUSTION ENGINE

Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 12, 1969, Ser. No. 875,647
Claims priority, application Germany, Nov. 13, 1968, P 18 08 632.3
Int. Cl. F02b *53/06*
U.S. Cl. 123—8.13 **20 Claims**



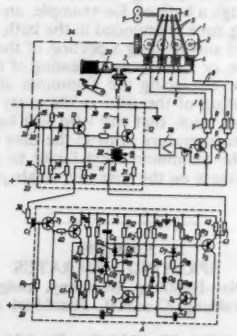
A rotary piston injection-type internal combustion engine, especially of trochoidal type of construction in which a throttle valve mounted on a throttle valve shaft is arranged in the inlet channel to control the amount of combustion air flowing through the inlet channel; the throttle valve and/or the throttle valve shaft are provided with one or several bores for the flow of combustion air through the same when the throttle valve is in the closed or partially open position.

3,620,196

ARRANGEMENT FOR APPLYING FUEL INJECTION CORRECTIONS AS A FUNCTION OF SPEED, IN INTERNAL COMBUSTION ENGINES

Wolf Wessel, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 28, 1970, Ser. No. 67,851
Claims priority, application Germany, Sept. 4, 1969, P 19 44 878.3
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 **20 Claims**



An arrangement by which corrections are applied to the pulses which open electromagnetically controlled valves for fuel injection in internal combustion engines. The opening pulses for the valves are generated by a monostable multivibrator to which a control voltage is applied. The mul-

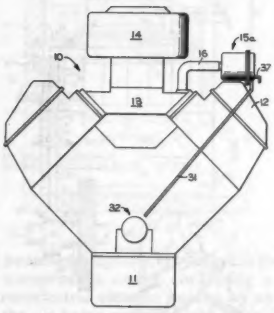
tivibrator emits substantially rectangular-shaped pulses, the durations of which are controlled as a function of speed of the engine, through the control voltage. The control voltage has characteristics variable periodically in synchronism with the pulses provided by the monostable multivibrator. A storage capacitor integrates the control voltage, and charging sources connected to the capacitor have different internal resistances. The charging sources are switched and connected to the capacitor in predetermined sequence.

3,620,197

CRANKCASE VENTILATING MEANS FOR SUBMERGED ENGINE OPERATION

Thomas M. Albright, Chillicothe, and James S. Barton, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 20, 1970, Ser. No. 4,337
Int. Cl. F02f *9/06*; F02m *25/00*
U.S. Cl. 123—119 B **5 Claims**



A crankcase ventilating means comprises a spring-biased valve means adapted to open to vent gases from the crankcase of an internal combustion engine to the intake manifold thereof when the pressure of such gases exceeds a predetermined level. The opening and closing of the valve means is automatically controlled by pressure level variations occurring in a control chamber normally communicating with ambient air pressure, via a pressure sensing conduit, during "on land" operations. An open end of the conduit is positioned adjacent to a crankshaft sealing area to sense the increasing pressure level occasioned thereat due to progressive submersion of the engine in water. Thus, the pressure level in the crankcase, required to open the valve means, will automatically increase in direct proportion to the increased depth of engine submersion.

3,620,198

SAFETY INSTALLATION IN A FUEL FEEDLINE

Werner Breitschwerdt, Stuttgart-Botnang, and Rudolf Andres, Sindelfingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed June 29, 1970, Ser. No. 50,720
Claims priority, application Germany, July 4, 1969, P 19 33 961.8
Int. Cl. F02b *77/08*; F02m *37/00*
U.S. Cl. 123—136 **14 Claims**

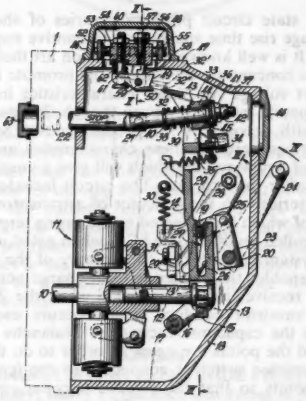
A safety installation for a fuel feedline supplying fuel from a fuel tank to an internal combustion engine driving a motor vehicle, which includes a valve that automatically closes in case of an accident and is kept open against the force of a closing spring by a pneumatic pressure medium available in the motor vehicle; the pressure medium flows to the valve through a line which is made from a material readily melting in case of a fire, and preferably several coupling members are arranged in the line which open the line in case of a slight pull.

3,620,199

CONTRIFUGAL GOVERNOR FOR THE RPM CONTROL OF INTERNAL COMBUSTION ENGINES

Karl-Ernst Kuhn, Grunbach; Heinz Kuschmierz, Gerlingen, and Heinrich Staudt, Markgroningen-Talhausen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 23, 1969, Ser. No. 887,545
Claims priority, application Germany, Jan. 8, 1969, P 19 00 675.8
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 R **5 Claims**



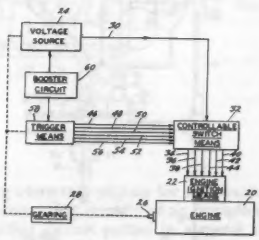
In a centrifugal governor for setting the fuel quantity control member of a fuel injection pump, there is provided an abutment for limiting the displacement of said member. Said abutment is adjustable both linearly along said member and angularly to vary the orientation of a curved abutment edge cooperating with a follower nose connected to said fuel quantity control member.

3,620,200

BOOSTER CIRCUIT FOR IGNITION SYSTEMS

Joe B. Stephens, and Joel N. Ashcraft, both of Columbus, Miss., assignors to AMBAC Industries Incorporated, Columbus, Miss.

Filed July 8, 1969, Ser. No. 839,886
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **19 Claims**



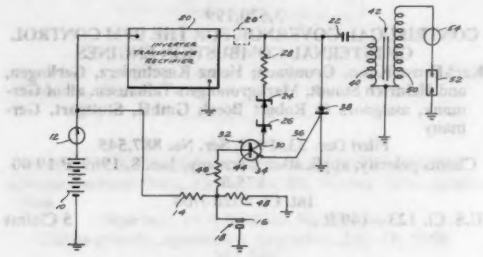
A booster circuit is employed with an ignition system for an internal combustion engine to assure that sufficient energy is supplied to engine ignition means for igniting fuel in the engine at predetermined engine speeds.

3,620,201

SOLID STATE MULTISPARK IGNITION SYSTEM

Glenn B. Warren, 1361 Myron St., Schenectady, N.Y., and John Randolph Morgan, 170 E. Coronado Road, Phoenix, Ariz.

Filed Oct. 7, 1969, Ser. No. 864,417
Int. Cl. F02p *1/00*
U.S. Cl. 123—148 E **2 Claims**



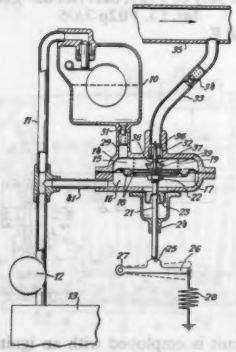
A solid state circuit provides a series of short duration short voltage rise time sparks for automotive engine ignition purposes. It is well known in the ignition art that short duration sparks concentrate the energy and promote ignition, and that "short voltage rise time" characteristics in an ignition system promote good firing even though the spark plugs are covered with deposits. A "Capacitor Ignition System" such as is described here has these characteristics and is used as the basis of a new system which will give a continuing series of sparks after the first one. The circuit includes two Zener diodes in series with the collector of a transistor switch, the collector of which is connected to the gating terminal of a silicon controlled rectifier. The SCR, when gated, connects the ignition system capacitor to the primary of the ignition coil and thus enables the capacitor to discharge across the coil. The SCR receives the gating signal when the Zener diodes and the transistor conduct, which occurs each time the charge on the capacitor reaches the avalanche level of the diodes and the points are open. In order to do this, the base of the transistor switch is connected to the ignition system breaker points so that the circuits become operative only when the breaker points open. The present circuit serves to replace the single spark per ignition of conventional automotive ignition circuits with a series of sparks generated at a predetermined frequency.

3,620,202

FUEL SUPPLY DEVICES FOR COLD STARTING OF INTERNAL COMBUSTION ENGINES

Gray E. D. Ross, Tring, England, assignor to The Zenith Carburetter Company Limited, Stanmore, Middlesex, England

Filed Dec. 8, 1969, Ser. No. 882,871
Claims priority, application Great Britain, Dec. 17, 1968, 59,964/68
Int. Cl. F02m *1/16*
U.S. Cl. 123—179 G **9 Claims**



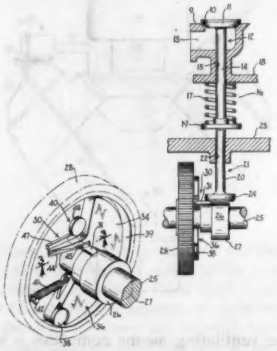
A fuel supply device for supplying fuel to provide a cold-starting mixture in an internal combustion engine in which fuel is expelled from a chamber into the engine induction system by movement of a movable wall of the chamber which movement is caused by means dependent on the initiation of an engine-starting operation, the volume of the chamber being controlled by thermostatic means dependent on engine temperature so that the quantity of fuel available is greater when the engine temperature at starting is lower. Fuel is fed automatically into the chamber as its volume increases due to fall of temperature, and the outlet from the chamber is closed by a valve when its volume is reduced to a minimum.

3,620,203

AUTOMATIC COMPRESSION RELIEF MECHANISM

Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 11, 1970, Ser. No. 18,509
Int. Cl. F01l *13/08*
U.S. Cl. 123—182 **6 Claims**



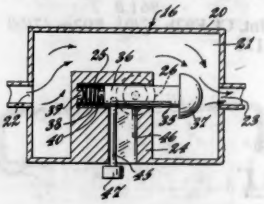
During each revolution of the engine camshaft at cranking speed, a camshaft-carried pin effects momentary unseating of a valve and opening thereby of a compression relief port in the combustion chamber of the engine, to reduce the cranking effort. The pin is guided for lengthwise sliding movement axially along the exterior of the camshaft, and it is automatically moved to an inoperative position by a centrifugally responsive control member whenever the camshaft is rotated at the higher speeds that obtain during operation of the engine under its own power.

3,620,204

SAFETY SHUTOFF FOR ENGINES

Edward M. Baltadonis, Kings Highway, Mt. Royal, N.J.

Filed Apr. 30, 1969, Ser. No. 820,492
Int. Cl. F02b *77/08*; F01p *1/14*
U.S. Cl. 123—198 **4 Claims**



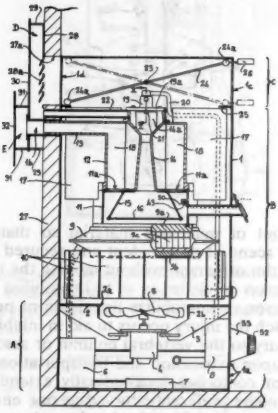
An engine shutoff including a hollow chamber connected in the engine fuel line and quick-acting valve means in the chamber for effectively closing the fuel line at a location adjacent to the engine.

3,620,205

HEATING APPARATUS FOR CARAVANS AND THE LIKE

Michel Vial, Rhone, France, assignor to Application de Gaz, Paris, France

Filed Nov. 28, 1969, Ser. No. 880,623
Claims priority, application France, Nov. 29, 1968, 50,695
Int. Cl. F24h *3/06*; H01v *1/32*
U.S. Cl. 126—110 E 13 Claims



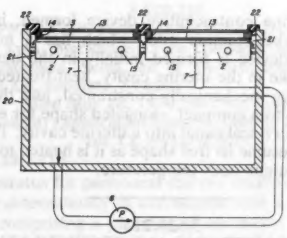
A portable heater particularly for caravans forming a thermogenerator comprises a casing containing a substantially flat plate thermoelectric element heated by an inverted gas burner tube, the air being circulated by a fan from the bottom of the casing onto the underside of the base of the heating element, around the element and over the outside of the burner tube which forms a heat exchanger and is then distributed onto the room to be heated, means being provided for regulating the heat passing to the room and for charging a battery to supply electric current for lighting room.

3,620,206

FLUID HEATING BY RADIATION

William B. Harris, Jr. III, Huntsville; William B. Harris, Bryan, and Richard R. Davison, Bryan, all of Tex., assignors to The United States of America as represented by the Secretary of the Interior

Filed Mar. 24, 1970, Ser. No. 22,315
Int. Cl. F24j *3/02*
U.S. Cl. 126—271 11 Claims



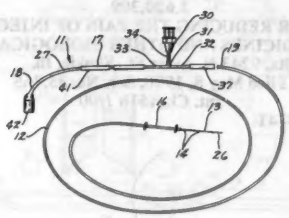
Radiant energy is used to heat a liquid by passing the liquid between two level, flat, heat exchange surfaces, the top surface resting freely on the lower surface and being exposed to the radiant energy. Liquid flows between the surfaces and is maintained in a thin, continuous and substantially uniform film by operation of Bernoulli's Theorem. In a preferred embodiment, water is heated by solar radiation and the heat exchange surfaces float on a reservoir of the water being heated.

3,620,207

BLOOD FLOWMETER

John C. Sinclair, Storm Lake, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 14, 1969, Ser. No. 824,518
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 F 10 Claims



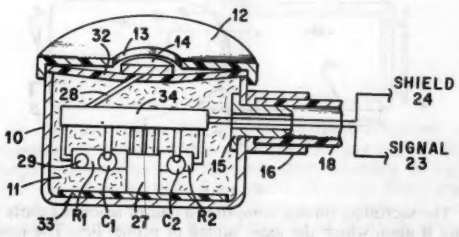
This invention relates to a blood flowmeter comprising a catheter suitable for insertion into a blood vessel, thermal resistors (thermistors) connected in electrical circuits disposed in the catheter near the insertable end of the catheter; and moving means for moving the thermistors out of the insertable end of the catheter into the blood flow and, when desired, back into the catheter. Means are also provided for measuring electrical response through the thermistors. Flow characteristics in the blood vessels are determined by observing changes in measured electrical response through the thermistor circuits.

3,620,208

EKG AMPLIFYING ELECTRODE PICKUP

Wayne R. Higley; Harry L. Silcocks, and James A. Waggoner, all of Livermore, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 3, 1969, Ser. No. 873,223
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 E 10 Claims



An amplifying electrode pickup for an electrocardiograph (EKG.) device consisting broadly of an impedance converter integrated amplifier circuit potted in a metal shell. The integrated circuit is biased by a nanoamp electrical current. The EKG. signal is sensed by a small sensor plate or disc positioned in a boot or cover and is electrically insulated from the shell. The circuit has a very high input impedance to minimize the effect of skin contact resistance changes, and a very low output impedance to minimize noise pickup by the

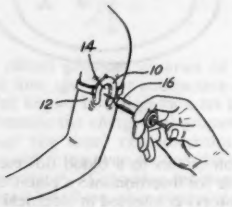
signal line between the electrode and the EKG. electronics. Electronic circuitry in the potted metal shell also includes a diode voltage clamp and decoupling RC circuits. A multiconductor cable provides shielding, conducts power to the electrode, and transmits the signal from the electrode through an integral coaxial cable. Because of the low (nanoamp) biasing current, signal traces of numerous separate electrodes can be simultaneously recorded without exceeding the maximum permissible current through the human body as established by the American Heart Association.

3,620,209

DEVICE FOR REDUCING THE PAIN OF INJECTIONS OF MEDICINES AND OTHER BIOLOGICALS

Harvey Kravitz, 9243 N. Avers St., Skokie, Ill.

Filed May 8, 1970, Ser. No. 35,765
Int. Cl. A61h *1/00*
U.S. Cl. 128—41 **6 Claims**



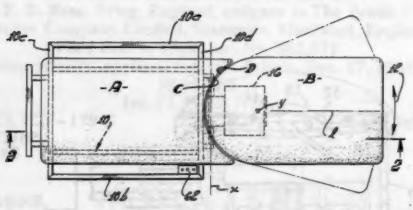
A device adapted to be placed upon the skin of a patient to be injected with medicine or other biological and capable of vibrating the skin at the injection area to stimulate the pain center of the skin such that the pain normally associated with injection of medication at said area by a needle or the like is reduced and minimized.

3,620,210

SACROILIAC ROTATOR

Robert F. Annas, Arcadia, and Vincent Hinsberger, Los Angeles, both of Calif., assignors to Paramount Health Equipment Corp., Los Angeles, Calif.

Filed Mar. 21, 1969, Ser. No. 809,274
Int. Cl. A61f *5/00*
U.S. Cl. 128—74 **3 Claims**



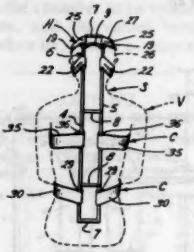
The sacroiliac rotator comprises a pair of adjoining parts A and B upon which the user, supine or prone, lies. The juncture between the parts falls approximately at the pelvic or sacroiliac region. Motion is imparted to one of the parts B in order to cause relative rotation of the upper and lower portions of the body about a center falling generally in the sacroiliac region. The part A has an arcuate recess or concavity C that fits the arcuate protuberance or convexity D of the part B. The opposite end of the part B is given a circular motion in a generally vertical plane in such manner that the arcuate parts C and D remain substantially in contiguous relationship. For this purpose, the horizontal axis *x* of up and down movement falls substantially at the crest of the companion parts, while the vertical axis *y* of sidewise movement falls substantially at the center of the arcuate parts. For this purpose, a special bracket E is provided.

3,620,211

EXTRICATION BACK SPLINT

Albert Goodell, and William L. Greene, both of P.O. Box 5406, Beaumont, Tex.

Filed May 7, 1969, Ser. No. 822,538
Int. Cl. A61f *5/04*
U.S. Cl. 128—89 **1 Claim**



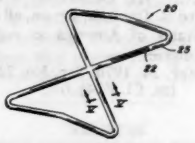
A back splint of malleable material so that it can be formed at the scene of an accident and secured to the portion of the victim or person without moving the injured portion or the person or victim so as to immobilize the injured part of the person or immobilize the victim or person in the position in which the injury occurs to aid in inhibiting further damage or injury to the vertebral column or associated portions thereof upon extrication and transportation of the victim. The splint comprises longitudinally extending, spaced malleable members preferably curved at one end for fitting on the victim to immobilize the head, neck, and vertebral column of an injured person to retain the person in such immobilized position to inhibit further injury upon extrication and transportation. The construction of the splint is such that it does not significantly interfere with radiological surveys.

3,620,212

INTRAUTERINE CONTRACEPTIVE DEVICE

Robert D. Fannon, Jr., Columbus; Brenton R. Lower, Columbus, Ohio, and Leonard E. Laufe, 1206 Inverness Ave., Pittsburgh, Pa.

Filed June 15, 1970, Ser. No. 46,419
Int. Cl. A61f *5/46*
U.S. Cl. 128—130 **8 Claims**



An intrauterine contraceptive device formed, in part at least, of a nickel-titanium alloy which has a mechanical memory. The device is formed initially in the desired free shape it will take in the uterine cavity, heat-treated with the free shape being mechanically constrained, and then plastically deformed to a compact, elongated shape for easy insertion through a cervical canal into a uterine cavity. The device will gradually resume its free shape as it is heated to temperature near the human body temperature.

3,620,213

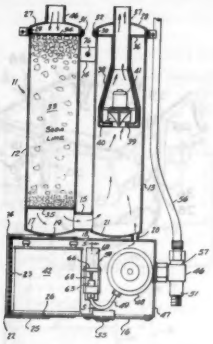
AIR-GAS METERING AND RECIRCULATING APPARATUS

Hilbert J. Savoie, Jr., P.O. Box 98, Boutte, La.

Filed Sept. 12, 1969, Ser. No. 857,374
Int. Cl. A62b *7/12;* **F15b** *5/00*
U.S. Cl. 128—142 **8 Claims**

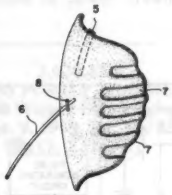
A combination air purifier and air supply metering apparatus adapted to be used with a diver's helmet and including an air blower in an air recirculation circuit containing a mass of soda lime through which used air is drawn. An air replenishing connection from an external source includes a nominal-pressure regulating valve and a depth-responsive

flow-regulating valve to automatically compensate for different depths at which a diver may be working, whereby to maintain adequate air replenishment regardless of depth. The



flow-regulating valve is operated by a Bourdon tube which changes its configuration in response to variations in back pressure in a replenishment chamber exposed to the air-recirculating circuit.

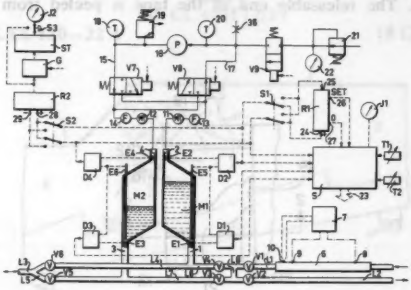
3,620,214
MOLDED SURGICAL MASK
Thomas Thackston, Florham Park, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Filed July 9, 1969, Ser. No. 840,405
Int. Cl. A62b *23/02*
U.S. Cl. 128—146.2 **5 Claims**



A molded surgical cup mask of three-ply construction, the first and third plies being of polyester batting acrylic emulsion bonded to form a durable film, the intermediate ply being unbonded microglass and the plies being molded into a unit by heat and pressure.

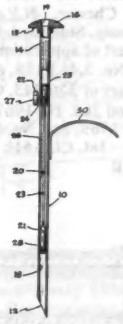
3,620,215
APPARATUS FOR PERITONEAL DIALYSIS
Jan Erik Tysk, Stockholm; Sven Olofsson, Skalby, and Nils Bertil Jacobson, Solna, all of Sweden, assignors to LKB Medical AB, Bromma, Sweden
Filed May 28, 1970, Ser. No. 41,312
Claims priority, application Sweden, June 4, 1969, 7891/69
Int. Cl. A61m *05/00*
U.S. Cl. 128—213 **14 Claims**

An apparatus for peritoneal dialysis treatment of a patient operating automatically in accordance with a predetermined program comprising a plurality of successive dialysis cycles each consisting of a fill-phase during which fresh dialysis fluid is introduced into the peritoneal cavity of the patient, a dialysis-phase during which the dialysis fluid remains in the peritoneal cavity, and a drain-phase during which the used dialysis fluid is withdrawn from the peritoneal cavity of the patient. The apparatus comprises two identical measuring vessels having lower fluid connections, which through fluid valve means can be connected alternatively to a supply conduit for fresh dialysis fluid, a discharge conduit for used dialysis fluid and a patient conduit connected to the patient being treated, and upper air connections, which can be connected alternatively to the delivery side and the suction side of an air pump. During the fill-phase, when fresh dialysis fluid is introduced into the patient, fresh dialysis fluid is sucked under vacuum into one of the measuring vessels from the supply conduit at the same time as fresh dialysis fluid is discharged under pressure from the other measuring vessel into the patient conduit and this takes place alternatingly for



the two measuring vessels. During the drain-phase, when used dialysis fluid is withdrawn from the patient, used dialysis fluid is sucked under vacuum into one of the measuring vessels from the patient conduit at the same time as used dialysis fluid is discharged under pressure from the other measuring vessel into the discharge conduit and this takes place alternatingly for the two measuring vessels.

3,620,216
IMPLANT TROCAR
Earl Thaddeus Szymanski, Chicago, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed June 25, 1969, Ser. No. 836,566
Int. Cl. A61m *5/00*
U.S. Cl. 128—217 **6 Claims**

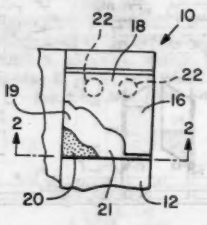


An implant trocar for treating animals comprises a reciprocatory plunger within a pellet-containing barrel. The plunger is controlled by an operating shaft extending through a guiding slot in the wall of the barrel. A curved finger grip extends from the barrel opposite the operating shaft and enables the rounded heel of the barrel to be located against the palm of the hand of the user.

3,620,217
DISPOSABLE DIAPER HAVING PRESSURE-SENSITIVE TAPE FASTENER AND BUILT-IN DISPOSAL FASTENER
Dale A. Gellert, Center Township, Dearborn County, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 18, 1970, Ser. No. 20,679
Int. Cl. A61f *3/16*
U.S. Cl. 128—284 **5 Claims**

An improved fastening device for securing the corners of a disposable diaper incorporates a built-in device which is use-

ful in disposing of the diaper after it has been soiled. The fastener itself comprises a strip of pressure-sensitive tape held in superposed relationship with respect to a corner of the diaper backing sheet prior to use. One end of the tape is directly adhered to the backing Sheet. A treated release liner is interposed between the backing sheet and the other end of the tape which is releasably held in contact with said release liner. The releasable end of the tape is peeled from the



release liner when the tape fastener is placed in use in the course of diapering a baby. After the diaper is soiled, it is rolled or folded up whereupon means associated with the release liner are used for securing the rolled or folded diaper. The means may be a pressure-sensitive adhesive area remaining on the backing sheet when the release liner is removed, or the liner itself can be provided with a pressure-sensitive adhesive that remains adhered to the release liner when it is peeled off.

3,620,218

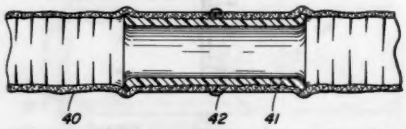
CYLINDRICAL PROSTHETIC DEVICES OF POLYGLYCOLIC ACID

Edward Emil Schmitt, Norwalk, Conn., and Rocco Albert Polistina, Port Chester, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 608,086, Jan. 9, 1967, now Patent No. 3,463,158, dated Aug. 26, 1969, and a continuation-in-part of 320,543, Oct. 31, 1963, now Patent No. 3,297,033, dated Jan. 10, 1967. This application Aug. 25, 1969, Ser. No. 852,617

Int. Cl. A61b *17/11*

U.S. Cl. 128—334 R **6 Claims**



Polyhydroxyacetic ester, also called polyglycolic acid (PGA), has surgically useful mechanical properties as a solid prosthesis, such as reinforcing pins, screws, plates, or cylinders. On implantation, in living mammalian tissue, the polyglycolic acid is absorbed, and replaced by living tissue.

3,620,219

FACIAL NERVE STIMULATOR

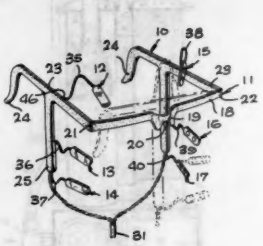
Donald E. Barker, 15225 Vanowen St., Van Nuys, Calif.

Filed May 7, 1969, Ser. No. 822,594

Int. Cl. A61n *1/36*

U.S. Cl. 128—410 **15 Claims**

A facial nerve stimulator including a number of electrode structures which are to contact the face of the user and electrically stimulate certain facial nerves and the related muscles, and a frame carrying the electrode structures on the face and adapted to be supported by engagement of a forward portion of the frame with the bridge of the nose, and by



engagement of two side portions of the frame with the ears of the user.

3,620,220

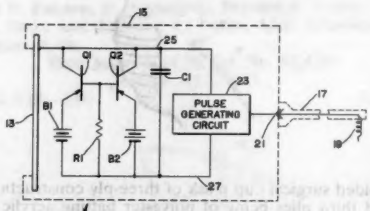
CARDIAC PACER WITH REDUNDANT POWER SUPPLY

William P. Murphy, Jr., Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Oct. 1, 1969, Ser. No. 862,657

Int. Cl. A61n *1/34*

U.S. Cl. 128—419 P **5 Claims**



The cardiac pacer disclosed herein employs a redundant power supply in which a pair of batteries are connected to pulse-generating circuitry through the collector-emitter circuits of respective transistors. A forward-biasing current is applied to the transistor base terminals, which are connected together, so that the batteries energize the pulse-generating circuitry jointly when both are in satisfactory condition and, upon the occurrence of a failure in one of the batteries, the failing battery is effectively isolated from the pacer circuitry.

3,620,221

DIATHERMY HAVING METER CIRCUIT INDICATING TRUE POWER DRAWN BY A PATIENT

Jerome W. Davis, Pasadena, Calif., assignor to Mettler Electronics Corporation

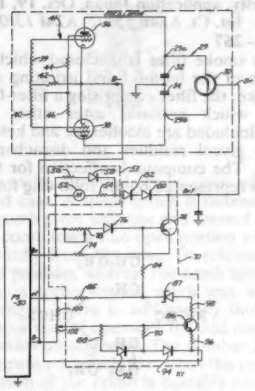
Filed July 30, 1969, Ser. No. 846,003

Int. Cl. A61n *1/08*

U.S. Cl. 128—422 **10 Claims**

A diathermy having a vacuum tube tuned plate-tuned grid oscillator including a coil for delivering high-frequency signals to a patient undergoing treatment. A meter coupled between the plate circuit for the tube and a source of poten-

tial therefor. A bypass circuit is coupled across the meter for bypassing a preselected amount of current causing an improved direct indication of power drawn by a patient undergoing treatment.

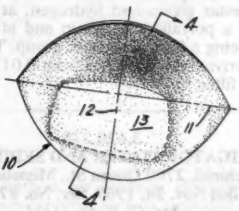


3,620,222

SHELFLESS PUSHUP BRASSIERE PAD

Lester W. Block, 8520 Warner Drive, Culver City, Calif.

Filed Sept. 9, 1969, Ser. No. 856,405
Int. Cl. A31c *3/10*
U.S. Cl. 128—481 5 Claims



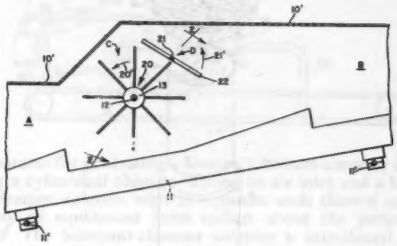
A pushup brassiere pad which elevates the breast without having any shelf, mound or other raised portion in the interior area which receives the breast. The interior of the pad has a substantially flat planar surface disposed beneath the horizontal axis of the pad and outwardly from the vertical axis of the pad. The pad is thicker in the region of the planar surface than in its other regions. The planar surface is slanted upwardly and inwardly to move the breast simultaneously upwardly and inwardly.

3,620,223

CROP AGITATOR FOR THE SEPARATING MECHANISM OF AGRICULTURAL COMBINES AND THE LIKE

Homer D. Witzel, Moline, Ill., and Pieter F. Olieman, Valkenswaard, Netherlands, assignors to Deere & Company, Moline, Ill.

Filed May 4, 1970, Ser. No. 34,190
Claims priority, application Germany, Jan. 14, 1970, P 20 01 386.9
Int. Cl. A01f *12/10*
U.S. Cl. 130—22 A 18 Claims



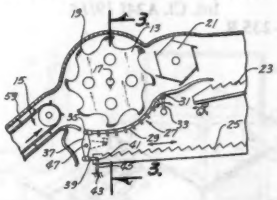
The separating mechanism of a combine is improved by the provision of a combination rotary and axially oscillating agitator acting on the crop passing lengthwise of the straw walkers so as to facilitate the separation of grain from straw.

3,620,224

VIBRATING CONCAVE FOR A COMBINE

Graeme R. Quick, and Adhemar Bradini, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Dec. 3, 1969, Ser. No. 881,681
Int. Cl. A01f *12/18*
U.S. Cl. 130—27 K 5 Claims



A vibrating or reciprocating concave for a combine which is positioned adjacent the threshing cylinder to enhance the threshing action. The concave may either by reciprocated fore or aft or side to side. Reciprocating power for the concave is provided by means of a linkage means connecting the pivotally mounted concave with an eccentric mounted on the cylinder drive shaft. Means is also provided for adjusting the clearance between the reciprocating concave and the cylinder. A modified form of the device is also disclosed and comprises a movable threshing belt positioned above a flat concave.

3,620,225

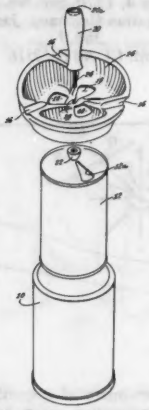
ASHTRAY

Doris S. Bailey, 4012 Don Felipe Drive, Los Angeles, Calif.

Filed Jan. 22, 1970, Ser. No. 5,028
Int. Cl. A24f *19/00*
U.S. Cl. 131—235 3 Claims

An improved ashtray assembly is provided which is intended to be used in conjunction with an empty disposable can of the type in which beer or other beverages are often merchandised. A cylindrical-shape holder is provided, in one embodiment, for receiving an empty can of the aforesaid type, the can having an opening in its top through which its contents were previously removed. A bowl-shaped top is also provided which has one or more holes in its bottom and

which may be aligned selectively with the opening in the top of the can contained in the holder, so that cigar and cigarette ashes and butts may be dropped down into the can for subsequent disposal with the can. The assembly includes a central handle and nut which serve to removably secure the top of the can.

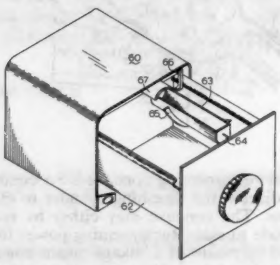


3,620,226

EXTINGUISHING ASHTRAY

Earl E. Eilertson, Albuquerque, N. Mex., assignor to Eugene Earl Eilertson, Utica, Mich. and Arnold M. Vie, Albuquerque, N. Mex., part interest to each

Filed May 22, 1970, Ser. No. 40,472
Int. Cl. A24f *19/14*
U.S. Cl. 131—235 R **11 Claims**



An ashtray for receiving and extinguishing lighted cigarettes, including a plurality of tubes of diameter slightly larger than the cigarettes to be extinguished. The cigarettes are placed in end to end relation into one end of the tube, the subsequently inserted cigarettes pushing the preceding cigarettes into a receiving container as they are being extinguished within the tube due to lack of sufficient air to supply the fire.

The ashtray may also be mountable in a chassis or the like to be concealable or movable out of the way, and in such embodiment may utilize a trough mounted within the receiving container. When a lighted cigarette is placed in the trough and the container moved to a second position, a means for restricting the air supply to the interior of the trough is moved over it to extinguish the cigarette, and as the container is moved from the second position, the extinguished cigarette is expelled from the trough into the receiving container by an appropriate expelling means.

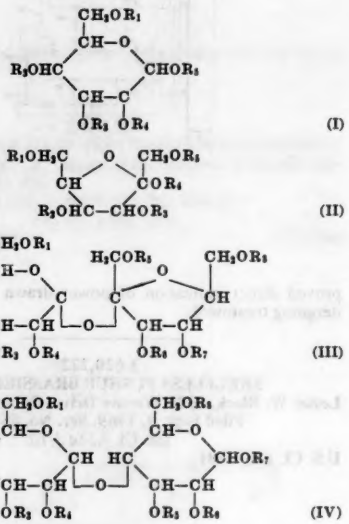
3,620,227

TOBACCO SMOKE FILTER

Atsushi Saito, Toyama-shi; Fumio Nakayama, Toyama-shi; Bungi Tamai, Toyama-shi; Hiroji Takahashi, Hiroshima-ken; Kazuo Kuwahara, Yamaguchi-ken, and Takashi Kaneko, Ohtake-shi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Mitsubishi Acetate Co., Ltd, Tokyo, Japan

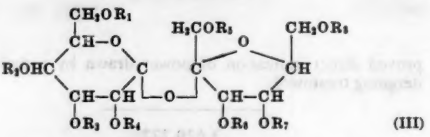
Filed Oct. 13, 1969, Ser. No. 865,993
Claims priority, application Japan, Oct. 19, 1968, 43/75907
Int. Cl. A24b *15/02;* **A24f** *13/06*
U.S. Cl. 131—267 **14 Claims**

A tobacco smoke filter is disclosed which is designed to remove some of the harmful and irritating substances from tobacco smoke, the filter comprising a filter-forming material or support which contains ester ether compounds of saccharides. Included are aldohexose and ketohexoses having polyalkylene glycol residues and dissacharides containing said hexoses. The compounds effective for the desired purposes may be represented by the following formulas:



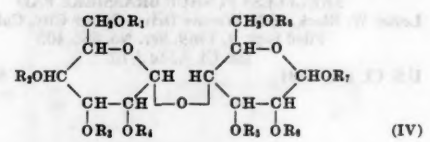
(I)

(II)



(III)

and



(IV)

wherein R_1 1/NR_4 represent any one of a polyalkylene group, a fatty acid ester group and hydrogen, at least one of the groups being a polyalkylene group and at least one of the groups also being a fatty acid ester group. The saccharide or saccharide derivative constitutes from 0.01 to 30 percent by weight of the filter.

3,620,228

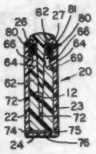
SOIL IRRIGATOR WATER AND SEDIMENT DRAIN

Howard C. Schmid, 2700 Queen St., Missoula, Mont.

Filed Nov. 24, 1969, Ser. No. 879,335
Int. Cl. F16k *15/04*
U.S. Cl. 137—107 **3 Claims**

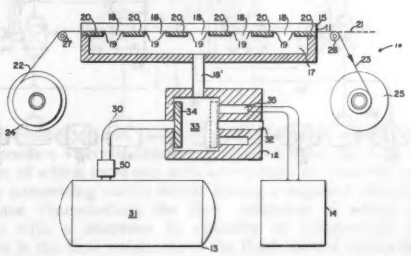
An improved device for attaching in the pipes of irrigating systems for removing silt and draining water composed of a tee for inserting in pipeline, a long drop pipe accommodating a valve seat, interior longitudinal flanges above said seat, and a buoyant captive ball between; ball being forced to seat under water pressure and rising when pressure is relieved, permitting silt and water to pass into open end sump below.

3,620,229
SHEATHED COMB
Ira J. Friedman, 8 Whittier Place, Boston, Mass.
Filed Nov. 3, 1969, Ser. No. 873,607
Int. Cl. A45d 24/42
U.S. Cl. 132—119 12 Claims



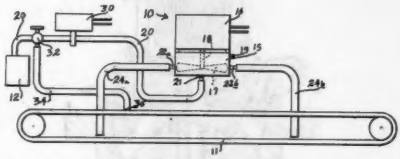
A comb is pivotally mounted on an open edged channel shaped elongated case. A spiral spring is fastened concentrically about the comb pivot with one end thereof engaging the case to bias the comb toward an open portion extending longitudinally outwardly from the case. To releasably lock the comb in a closed position, wherein the comb teeth are nested within the case, a spring biased catch and a pushbutton release are provided. There is additionally included within the case, a bibulous slab of open-cell foamed material having a plurality of parallel passageways. The number and positioning of the passageways are such that when the comb is within the case, each tooth of the comb is nestably received within one of the passageways. The bibulous slab may be impregnated with a liquid so that each time the comb is within the case, the individual teeth are wiped with the slab and liquid. A brush assembly is mounted on the inner walls of the case above the bibulous slab. The brush bristles abut the spine of the comb and insure the cleaning thereof.

3,620,230
MEANS AND METHOD OF CLEANING INFORMATION-CARRYING TAPE
Pierre G. Foret, Sudbury, Mass., assignor to P. G. Foret Inc., Sudbury, Mass.
Filed May 13, 1969, Ser. No. 824,061
Int. Cl. B08b 5/04, 7/02
U.S. Cl. 134—9 16 Claims



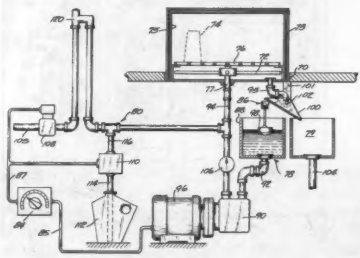
A means and method for cleaning elongated axially extending information-carrying tape is provided. The tape is passed over a plurality of slots positioned transversely to the longitudinal axis of the tape with each of the slots defining a cleaning edge and having a vacuum chamber thereunder. A pulsating vacuum is applied to the vacuum chamber to cause portions of the tape to be moved toward the vacuum chamber during passage over the slots with all portions of the tape being cleaned by vacuum action and by a scraping of the cleaning edge. The tape cleaning means has a plurality of seriatim arranged slots defined in part by seriatim arranged scraping edges. Means for passing the tape over the slots is provided and a vacuum chamber underlies the slots. A means for applying a pulsating vacuum to the chamber is provided so that portions of the tape are urged into the slots as the tape is moved thereover whereby unwanted material is removed from the tape by the vacuum and by the scraping action of the scraping edges.

3,620,231
FOAM-GENERATING APPARATUS AND METHOD OF USE
Carl A. Miller, Saint Paul, Minn., assignor to Economics Laboratory, Inc., Saint Paul, Minn.
Filed Jan. 7, 1970, Ser. No. 1,229
Int. Cl. B08b 3/08, 1/02
U.S. Cl. 134—15 12 Claims



Apparatus for generating a foamed lubricant-cleanser comprising a cylindrical chamber having an air inlet and a lubricant-cleanser solution inlet in opposite ends thereof and a plurality of equidistant foam outlets about the periphery thereof. The lubricant-cleanser solution is introduced into the chamber proximate the center of a fan positioned for rotation therein about an axis coincident with the axis of symmetry of the cylindrical chamber. The nonfoamed solution is converted into foam by the introduction of air into the nonfoamed solution centrifugally propelled by the fan. A method for lubricating and cleansing a moving surface such as a conveyor is also disclosed.

3,620,232
GLASS-WASHING DEVICE
Vito D'Angelo, West Allis, Wis., assignor to Vito-Bil, Inc., West Allis, Wis.
Continuation-in-part of application Ser. No. 610,567, Jan. 20, 1967, now abandoned. This application Mar. 28, 1969, Ser. No. 814,511
Int. Cl. A47l 15/46
U.S. Cl. 134—56 2 Claims

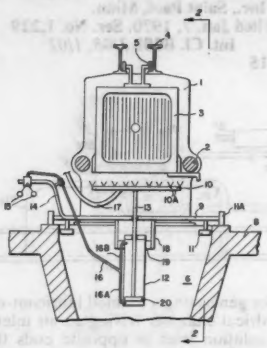


An automatic glass-washing machine including a pressure-responsive spray bar positioned to direct liquid detergent upwardly within an enclosed hood, a liquid detergent system for supplying detergent under pressure to the spray bar, a fresh-water system for supplying rinse water under pressure to the spray bar, a sanitizer system for supplying sanitizer to the fresh-water system, a timer to actuate the systems in a timed sequence and a float actuated valve to recirculate the liquid detergent and to direct the rinse water to an overflow or drain line.

3,620,233
FILTER PRESS WITH CLEANING APPARATUS
Oswald Busse, and Hugo Klesper, both of Michelbach, Germany, assignors to Passavant-Werke, Hutte, Germany
Filed July 8, 1970, Ser. No. 53,109
Claims priority, application Germany, July 11, 1969, G 69 27 408.4
Int. Cl. B08b 3/02
U.S. Cl. 134—57 R 14 Claims

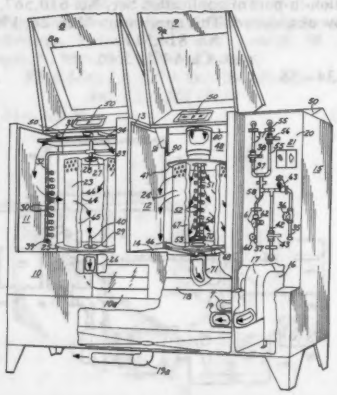
A cleaning device for a filter press. A spray tube is mounted on a carriage beneath the filter plates, the carriage

being movable lengthwise of the filter press and including a device to lift and lower the spray tube between a lowered position and a raised position, the spraying tube being



located in the raised position between filter plates to clean the same. The carriage may ride along the side bars of the filter press or it may ride along the top of a cake-catching basin located beneath the filter plates.

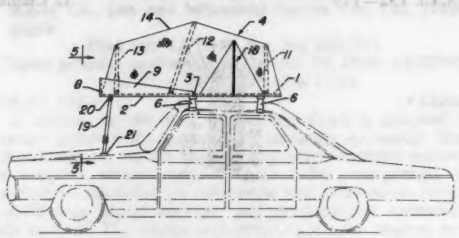
3,620,234
AIR-FILTER-CLEANING APPARATUS
Herbert L. Everrood, 688 Pontiac Way, Denver, Colo.
Filed July 7, 1969, Ser. No. 839,400
Int. Cl. B08b *3/02, 5/02*
U.S. Cl. 134—86 **6 Claims**



An apparatus for cleaning air filters of the accordion folded-paper type comprises a housing having two compartments, one for circulating cleaning fluids from the inside to the outside of a filter, and the other from the outside to the inside. Filter-mounting fixtures are provided in the compartments for effecting the required circulation of fluids. Both air and water are circulated through the filters in both compartments. Selective controls are provided to enable either or both of the compartments to be used.

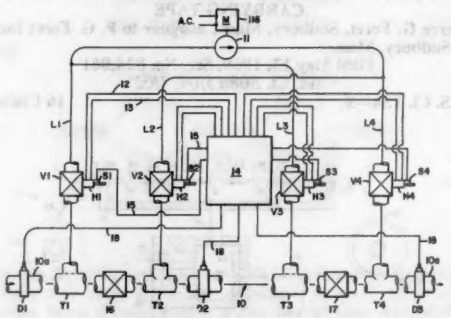
3,620,235
PORTABLE FOLDING SLEEPER UNIT
Filed Apr. 22, 1970, Ser. No. 30,767
Int. Cl. B60p *3/34*
U.S. Cl. 135—1 **7 Claims**

A folding camper unit which has a two-section base portion that utilizes a transverse hinging means between the two sections that is substantially flush with the top surfaces of the connected sections such that sleeping equipment may lay directly over the hinging area. One section of the base is provided with an end wall member and opposing triangular-form sidewall members so as to adapt such section to serve as a top cover over the other section and the camper unit folded



into a resulting wedge-shaped traveling arrangement having a low wind resistance when carried on or secured to a car, boat, or other type vehicle.

3,620,236
PUMPING STATION BYPASS SYSTEM AND METHOD
Lyle R. Van Arsdale; Francis M. Lathrop, and Vernon R. Reaves, all of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.
Filed May 4, 1970, Ser. No. 34,472
Int. Cl. B08b *9/04*
U.S. Cl. 137—13 **7 Claims**

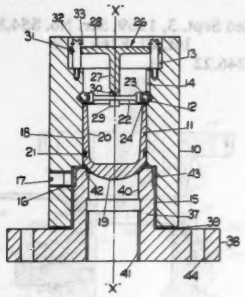


A system and method for pumping stations of pipeline wherein product-separating spheres are passed by the pumps by controlling flow of liquid through a plurality of flow-tees. A special timing arrangement is employed whereby each sphere is reinserted into the flow downstream of the station in the same relative position that it occupied when it approached the station.

3,620,237
SAFETY VALVE
John Henry Sindall, Worcester, and Frederick Charles Dixon, Chester, both of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England
Filed June 6, 1969, Ser. No. 831,176
Claims priority, application Great Britain, June 12, 1968, 27,904/68
Int. Cl. F16k *17/00*
U.S. Cl. 137—67 **4 Claims**

A safety valve comprising a piston slidably engaged within a bore for a housing and having releasable retaining means

holding the piston against the effect of pressurized fluid, and further means responsive to a precalculated change of pressure to release the retaining means and release the fluid.

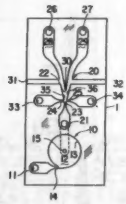


3,620,238

FLUID-CONTROL SYSTEM COMPRISING A VISCOSITY COMPENSATING DEVICE

Minoru Kawabata, Asahi-machi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Asahi-machi, Kariya-shi, Aichi Prefecture, Japan

Filed Dec. 29, 1969, Ser. No. 888,740
Claims priority, application Japan, Jan. 28, 1969, 44/6219
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 **4 Claims**



Fluid-control system comprising fluid-control means having a positive viscosity-resistance characteristic the flow resistance of which increases with an increase in viscosity, and further comprising vortex means having a negative viscosity-resistance characteristic the flow resistance of which increases with a decrease in viscosity to compensate for changes in the flow resistance of the fluid-control means due to changes in fluid viscosity. The vortex means is provided with a circular hollow chamber, a tangential nozzle connected to a source of incompressible and viscous pressure fluid, and a central output port connected to the fluid control means.

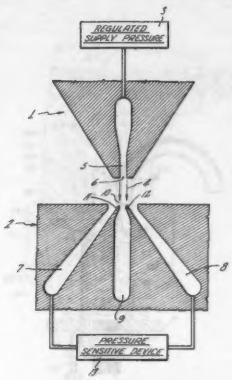
3,620,239

FLUIDIC ANGULAR POSITION TRANSDUCER

Lawrence S. Bright, East Granby, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Aug. 4, 1969, Ser. No. 847,134
Int. Cl. F15c *3/12*
U.S. Cl. 137—81.5 **1 Claim**

A power stream emanating from a rotatable supply unit is divided between two divergent output channels in a splitter-receiver section. A center dump is interposed between the output channels forming two tapering leading edges upon which the power stream impinges. The pressure differential between the two channels is indicative of the angular position of the supply unit. In a second arrangement an eccentrically mounted cam impedes the flow from two opposed nozzles. The differential pressure upstream of the nozzles is measured by a fluidic proportional amplifier. The upstream pressure differential is a function of the cam's angular position.



ERRATUM

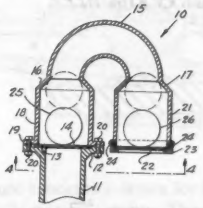
For Class 137—107 see:
Patent No. 3,620,228

3,620,240

DOUBLE CHECK VALVE VENT

William Bogdanski, 7964 Burnfield Cres., Burnaby, British Columbia, Canada

Filed Mar. 13, 1970, Ser. No. 19,347
Int. Cl. B65d *51/16*; F16r *45/02*
U.S. Cl. 137—202 **1 Claim**



A double check valve vent in which floatable valves are positioned in a vent line to be floated up against a valve seat when fluid flows outwardly from the tank or flows inwardly toward the tank. The floatable valve in the absence of fluid are each spaced a substantial distance from its respective valve seat so that fumes venting from the tank may move freely with a complete absence of back pressure.

3,620,241

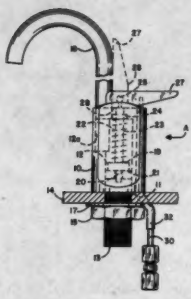
COMBINATION PLUMBING FIXTURE FOR WATER PURIFICATION SYSTEM HAVING WASTE BYPASS FLOW

Ross M. Brown, Palos Verdes Estates, Calif., assignor to Desalination Systems Inc., Escondido, Calif.

Filed Aug. 3, 1970, Ser. No. 60,409
Int. Cl. E03c *1/10*
U.S. Cl. 137—216 **10 Claims**

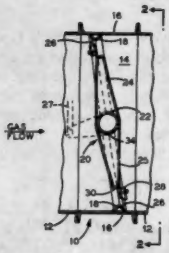
In a water purification system wherein a supply of pressurized, potable, product water is to be dispensed as required, and a small volume flow of nonpressurized byproduct waste water is to be discharged to a potentially contaminated drain, a combination plumbing fixture comprises a body with a valve-controlled passage therethrough for dispensing the potable water. A pair of axially upright ducts are provided through a faucet body, the lower end of one of the ducts being connected to receive the flow of waste byproduct water, and the lower end of the other duct being connected to the drain. A recess in the body encompasses

the upper ends of both ducts, and a gooseneck tube is fitted into the upper end of said one duct and discharges the waste



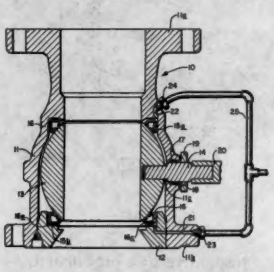
water in a free fall into the other duct. A vent opening in the other duct provides an antisiphon airgap.

3,620,242
SELF-CLEANING DAMPER ASSEMBLY
Morris G. Pease, Wadsworth, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed Jan. 5, 1970, Ser. No. 517
Int. Cl. F16k *1/22*
U.S. Cl. 137—240 **7 Claims**



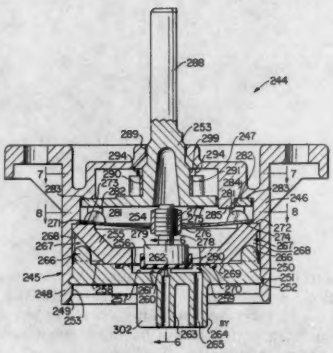
A damper assembly within a duct and a generally upright frame member having an interior damper seating surface, a shaft horizontally mounted and pivoted on the frame member with a blade member, including upper and lower body sections attached thereto. A gas jet adjacent the edge of the lower body section of the blade member affords means for removing particulate matter which tends to settle on the seating surface. A gas inlet and associated gas passageway are in flow communication with the gas jet, the gas inlet supplying a purge fluid to the gas jet. Means are also provided for rotating the blade member between first and second positions to open and close the damper.

3,620,243
SEALED BALL VALVE
Edward J. Zatopek, and James L. Bitting, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
Filed Sept. 3, 1969, Ser. No. 854,875
Int. Cl. F16k *5/06*
U.S. Cl. 137—246.22 **6 Claims**



A ball valve comprising a seal ring having a groove in the face thereof and a liquid sealant in said groove.

3,620,244
VACUUM REGULATOR AND PNEUMATICALLY OPERATED FUEL CONTROL SYSTEM UTILIZING THE SAME
Larry V. Nisley, Goshen, Ind., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Aug. 6, 1970, Ser. No. 61,724
Int. Cl. F16k *31/12*
U.S. Cl. 137—315 **20 Claims**

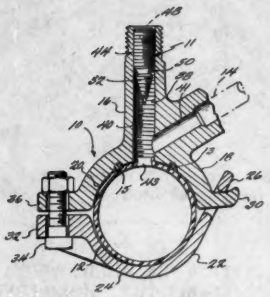


A vacuum regulator comprising a housing means having a valve seat controlled by a flexible diaphragm biased toward its open position by a leaf spring. A selector means is operatively interconnected to the leaf spring to rotate the same and thereby vary the bowed condition of the leaf spring to vary the vacuum condition being maintained by the vacuum regulator. The leaf spring has an internally threaded portion threadedly receiving an externally threaded part of the diaphragm member.

3,620,245
PERFORATOR AND APPARATUS FOR USING SAME
Robert R. Finney, Decatur; Lawrence F. Luckenbill, Decatur, and Gerry E. Kissell, Charleston, all of Ill., assignors to Mueller Co., Decatur, Ill.
Filed Oct. 21, 1969, Ser. No. 868,040
Int. Cl. B23b *41/08*
U.S. Cl. 137—318 **28 Claims**

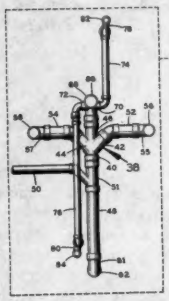
An apparatus for opening a flow-way in a main when a main is to be connected to a secondary main or service line.

In opening the flow-way in the main, a perforator or tapping tool is utilized, which will progressively form the hole or aperture in the main by upsetting the material of the main



outwardly of the same into the through bore of a fitting attached to the main, the upset material acting as a mechanical fastening means for increasing the resistance of a fitting to twist about the axis or centerline of the main.

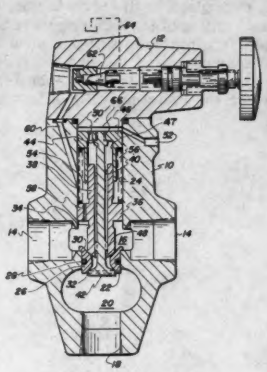
3,620,246
PLUMBING APPARATUS
William A. Shoquist, Pompano Beach, Fla., assignor to Behring Corporation, Ft. Lauderdale, Fla.
Filed Jan. 9, 1970, Ser. No. 1,777
Int. Cl. A47k *4/00*; **F16l** *5/00*
U.S. Cl. 137—357 **7 Claims**



Plumbing apparatus for draining water from tubs and commodes or the like in a limited vertical space and with a single sewer connection, the apparatus including a connector having four arms, one of which has two inlets, with a sewer drain line connected to one arm, commode drain lines connected to two other arms, and tub drain lines connected to the two inlets of the fourth arm.

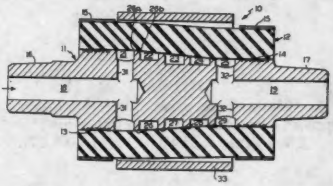
3,620,247
POWER TRANSMISSION
John W. Curnow, Utica, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed May 28, 1970, Ser. No. 41,343
Int. Cl. F16k *17/10*
U.S. Cl. 137—489 **8 Claims**

A pilot-operated pressure relief valve has two concentric poppets in series between the inlet and outlet and each is controlled by a piston tending to open the same. The piston for the upstream poppet is responsive to inlet pressure and the piston controlling the downstream poppet is responsive to the pressure between the poppets which is a predetermined fraction of the inlet pressure. The valve is useful for minimizing foaming with fluids susceptible thereto and may be also



utilized in systems where a fixed ratio is to be maintained between the pressures in two different parts of the system.

3,620,248
BACKPRESSURE DEVICE
Francis H. Cary, Hope, R.I., assignor to General Signal Corporation
Filed July 20, 1970, Ser. No. 56,620
Int. Cl. F16k *17/18*
U.S. Cl. 137—493 **6 Claims**



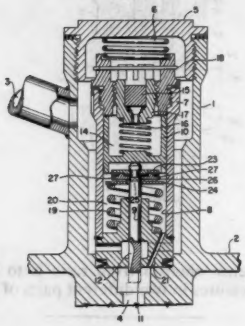
The disclosure concerns a device for imposing a back pressure on hydraulic metering pumps. The device includes a plurality of serially arranged, annular orifices defined by peripheral, axially spaced lands on a rigid mandrel, and an encircling, stretched elastomeric sleeve. The preload in the sleeve at each land determines the upstream pressure required to open the orifice and allow flow across the land, and the preloads are controlled by design so that none of the orifices creates a pressure differential which results in damaging cavitation.

3,620,249
FLOW CONTROL VALVE FOR FUEL INJECTION NOZZLES AND THE LIKE
Harold C. Simmons, Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed June 8, 1970, Ser. No. 44,352
Int. Cl. F16k *17/04*
U.S. Cl. 137—503 **14 Claims**

A flow control valve characterized in the provision of a piston-actuated metering valve member in which the piston has one side thereof exposed to fluid pressure upstream of the metering orifice and the other side thereof exposed either to fluid pressure downstream of the metering orifice or to combustion chamber pressure, the piston being of such large size as to require a valve-biasing spring of such high spring rate that the friction of the metering valve member and of the piston in their guide bores in the valve body is negligible in comparison with the valve-operating forces, thus to render

the metering valve member very sensitive to small changes in fluid pressure differential acting on opposite sides of the piston. Furthermore, an adjustable lower rate spring acts on the piston in opposition to the valve-biasing spring so as to enable accurate setting of the metering valve member.

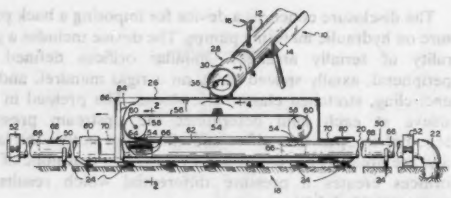
Another characterizing feature of this invention is that the metering valve member and piston have radial floating and axial abutting engagement with each other to prevent binding contact between the metering valve member and its guide



bore and between the piston and its guide bore despite eccentricity of said bores.

Yet another characterizing feature of this invention is the provision of a gimbal between the metering valve member and the adjacent end of the valve-biasing spring so as to prevent binding or cocking of the metering valve member in its guide bore in the event that the spring ends are not perfectly square relative to the axis of the metering valve member.

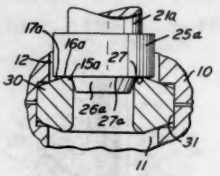
3,620,250
IRRIGATION APPARATUS
Gregory J. Wieck, Enterprise, Oreg., assignor to Battelle Development Corporation, Columbus, Ohio
Filed Sept. 4, 1969, Ser. No. 855,276
Int. Cl. A01g *25/02*
U.S. Cl. 137—561 **5 Claims**



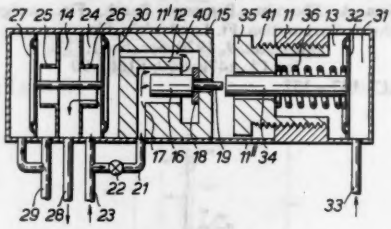
A movable irrigation line is supplied with water from an extraction tube movable with the line along a supply line having spaced outlet valves which are sequentially opened when in the extraction tube. The extraction tube has therein an endless belt carrying valve actuators which keep at least one of the valves in the tube opened.

3,620,251
VALVES
John C. Bowen, Huntingdon Valley, Pa., assignor to The Duriron Company, Inc., Dayton, Ohio
Filed Jan. 21, 1970, Ser. No. 4,515
Int. Cl. F16k *25/00*
U.S. Cl. 137—614.11 **5 Claims**

A valve for high-pressure fluids is provided in which multiple seating is effected by multiple engagement of seating portions of the valve plug one of which is transversely outwardly of the other with an expanding tapered or flared portion so that the operator can feel the seating and so that material displaced by one seating portion of the valve plug bucks or is in opposition to the material displaced by the other.



3,620,252
PNEUMATIC THRESHOLD SWITCH WITH ADJUSTABLE THRESHOLD LEVEL
Heinz Topfer, and Manfred Rockstroh, both of Dresden, Germany, assignors to VEB Reglerwerk Dresden, Dresden, Germany
Continuation-in-part of application Ser. No. 630,064, Apr. 11, 1967, now abandoned. This application Dec. 3, 1969, Ser. No. 881,688
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.6 **6 Claims**

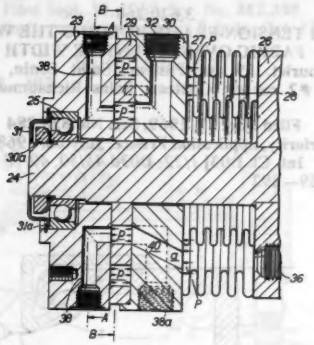


A pneumatic threshold switch comprises a pneumatic pressure release switch for producing a pneumatic binary signal when actuated, and a pneumatic servomotor. The pneumatic servomotor comprises a housing, a chamber, a servo diaphragm in the servo chamber, a servo piston affixed at one end thereof to the servo diaphragm and actuating at the other end thereof the pressure release switch, and a threshold level adjuster for applying an adjustable threshold level force to the servo piston surface of the servo diaphragm. The threshold switch is released by increasing the pressure in the servo chamber above the preadjusted threshold level force.

3,620,253
ROTARY DISTRIBUTOR
Gordon Richard Walker, and William Murray, both of Leamington Spa, England, assignors to Filton Limited, Leamington Spa, England
Filed Apr. 30, 1969, Ser. No. 820,550
Int. Cl. F16k *11/00;* **F16l** *27/00*
U.S. Cl. 137—625.11 **3 Claims**

A rotary distributor for sequentially distributing a fluid to different regions comprising two coaxial, ported ring members, one of the members having a coaxial ported plate attached thereto and arranged in face-sealing relation with the other member, each member having fluid ports arranged so that fluid flows through the ports in one member and through the ports of the ported plate to the ports of the other member, the direction of fluid flow being parallel to the axis of the coaxial members, the ported plate controls communication between the ports in one member and those in the other member, and means whereby fluid delivered to the dis-

tributor for passage through the ported members and the ported plate also serves to apply pressure on one side of the



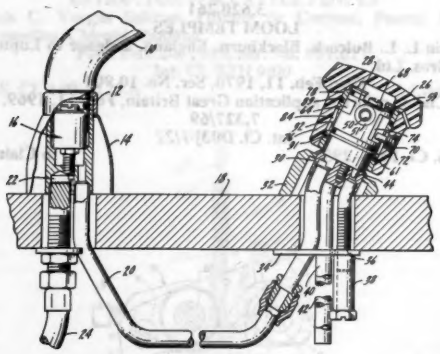
ring members to maintain the members in face-sealing relation.

3,620,254

HANDLE VALVE

Paul Mongerson, Elyria; Alfred M. Moen, Grafton, and Frank W. Bell, Avon, all of Ohio, assignors to Standard Screw Company, Hartford, Conn.

Filed Sept. 22, 1969, Ser. No. 859,835
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.17 **11 Claims**



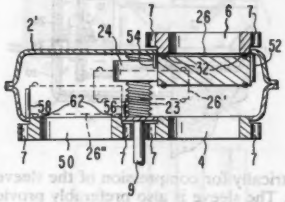
A single handle mixing faucet having a body member with inlet passages terminating at the exterior of the body member. A handle is reciprocal and rotatable on the body member and includes a confined circumferentially extending mixing chamber arranged to be placed into selective communication with the hot and cold water inlet passages terminating on the exterior of the body member. The body member is secured to an underlying support by a fastener which extends completely through the body member and has a tool-receiving opening at its upper end. In one form there are two discharge passages in the body member and cooperative means on the body member and handle to select one or the other of the discharge passages. In another form, the discharge passage extends away from the inlet passages and into a spout support which is mounted on top of the body member. The handle means which is reciprocal and rotatable on the body member includes a plurality of inlet ports arranged in two sets, one for hot water and one for cold water. The ports are generally uniformly arranged with there being more cold water ports than hot water ports so as to provide a greater degree of handle rotation within the comfort zone.

3,620,255

ROTARY GATE VALVE

Ben Stillman, Cupertino, Calif., assignor to Adcotech Corporation, Mountain View, Calif.

Filed July 31, 1970, Ser. No. 59,985
Int. Cl. F16k *3/10*
U.S. Cl. 137—625.45 **9 Claims**



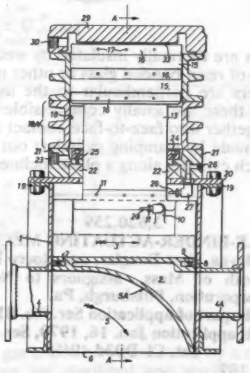
A thin quick action rotary gate valve that require a short insertion length in the fluid line being controlled. In the closed position, a valve gate is held against the valve seat by a combination of fluid pressure and mechanical forces. To open the valve, the gate is moved directly away from the seat to avoid rubbing or wedging, and is then rotated out of the fluid path so as not to obstruct flow. In closing, the reverse action takes place to provide a nonrubbing closure.

3,620,256

PIPELINE VALVES

William J. C. Trythall, 18 South Parade, Whiteley Bay, Northumberland, England

Filed Jan. 22, 1970, Ser. No. 5,010
Claims priority, application Great Britain, Feb. 3, 1969, 5,789/69
Int. Cl. F16k *11/02*; F16j *15/00*
U.S. Cl. 137—625.48 **4 Claims**



A valve for insertion in a pipeline through which material in powdered or granular form is conveyed pneumatically is so constructed that in one setting of the valve the material entering the valve is passed to a discharge outlet of the valve; and in a second setting of the valve said discharge outlet is closed and the material entering the valve flows through the valve and back into the pipeline.

3,620,257

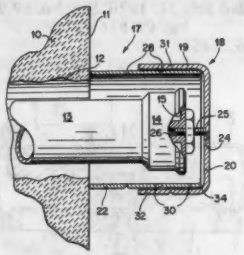
ADJUSTABLE CLEANOUT COVER

Richard H. Wright, Jr., Rte. 1, Packinghouse Road, Kingsport, Tenn.

Filed June 10, 1970, Ser. No. 44,984
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **6 Claims**

A cover assembly for a cleanout pipe and plug projecting outwardly beyond an upright wall surface, including a cap

having a cylindrical wall and a telescopingly received cylindrical sleeve longer than the cylindrical wall of the cap, and threaded fastening means securing the cap to the plug of the



pipe concentrically for compression of the sleeve against the wall surface. The sleeve is also preferably provided with annular scores to form separable sleeve sections for varying the effective length of the sleeve.

3,620,258
INSULATION

Robert Graham, Great Lumley, England, assignor to Newalls Insulation & Chemical Company Limited, Manchester, England

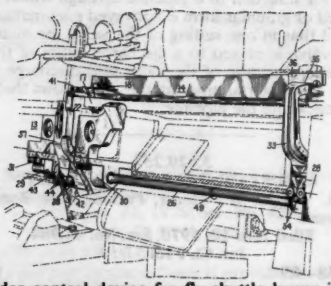
Filed Apr. 15, 1970, Ser. No. 28,828
Claims priority, application Great Britain, Apr. 16, 1969, 19433/69
Int. Cl. F16l *9/22*
U.S. Cl. 138—178 **2 Claims**

Curved pipes are thermally insulated by wedge-shaped annular elements of resin-bonded glass or other mineral fiber in which the fibers are perpendicular to the axes of the elements, so that these are axially compressible. The elements are pressed together into face-to-face contact along the pipe. They may be made by stamping cylinders out of fiberboards and cutting each cylinder along a plane inclined to the axis.

3,620,259
SHUTTLE-BINDER-ACTUATING MECHANISM

Joseph M. Budzyna, East Douglas, and Rocco H. Mucciarone, Franklin, both of Mass., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 814,049, Apr. 7, 1969. This application Jan. 16, 1970, Ser. No. 3,419
Int. Cl. D03d *49/56*
U.S. Cl. 139—187 **5 Claims**

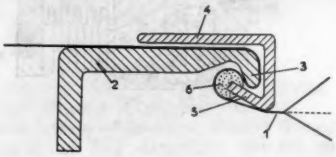


A binder control device for fly shuttle looms including a bar member with binder-engaging fingers fixed thereon and lever means for applying and releasing pressure on the binder through said bar member in timed relation with the receiving and picking of a shuttle from the shuttle box.

3,620,260
LOOM TENSION-FRAME HOLDING THE WOVEN FABRIC OVER ITS ENTIRE WIDTH

Claude Bourlet, 59 rue Pasteur, Saint Benin, and Louis Deprez, #2 rue du Chateau, Sains Richaumont, both of France

Filed May 27, 1969, Ser. No. 828,284
Claims priority, application France, July 22, 1968, 160,126
Int. Cl. D03j *1/22*; **D03d** *45/50, 49/70*
U.S. Cl. 139—292 **10 Claims**

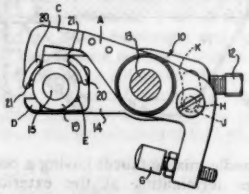


Tension plate for holding woven fabric over all its width, comprising a fixed plate the front edge of which is turned down to form a lip, the edge being surrounded, after interpositioning of the fabric by a mobile floating-oscillating section composed of a face substantially parallel to said plate for applying on aid plate and a face substantially following the contour of said lip and extending backwards of said lip.

3,620,261
LOOM TEMPLES

Colin L. L. Bulcock, Blackburn, England, assignor to Lupton Bros. Ltd.

Filed Feb. 11, 1970, Ser. No. 10,901
Claims priority, application Great Britain, Feb. 11, 1969, 7,327/69
Int. Cl. D03j *1/22*
U.S. Cl. 139—295 **6 Claims**

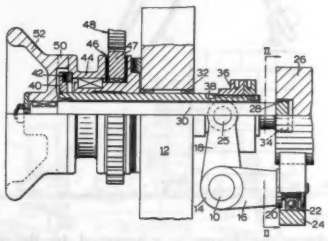


A cover for association with the rotary barrel of a loom temple comprises at least two part-cylindrical sections adapted for mounting either above or below the axis of said barrel, one or each such cover being capable of adjustment, circumferentially or radially of the latter, with reference to the other.

The several cover sections may be movable independently of one another about the barrel axis, and they may be arranged at different distances from such axis so as to be capable of telescoping one within another.

Alternatively two sections of a three-part cover may be individually slidable upon the third part for adjustment circumferentially of the barrel, or at least two cover sections may be independently adjustable towards or away from such barrel.

3,620,262
CLOTH ROLLER DRIVES FOR LOOMS
Cyril M. Atkinson, Carnforth, England, assignor to Northrop Weaving Machinery Limited, Daisyfield, Blackburn, Lancashire, England
Filed Sept. 30, 1969, Ser. No. 862,398
Claims priority, application Great Britain, Oct. 12, 1968, 48,465/68
Int. Cl. D03d 49/20
U.S. Cl. 139—307 6 Claims



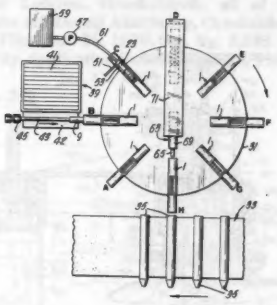
A loom cloth roller drive mechanism includes a friction drive, transmitting drive from a driving shaft to said cloth roller, and weighing means whereby an increase in the weight of said cloth roller causes the load on said friction device to increase and therefore maintains a more even tension in the cloth as it is being wound on said cloth roller.
The weight of said cloth roller supported on freely rotatable rollers causes the lever to pivot on a fixed point, said lever-transmitting movement to the driven member of the clutch. so as to apply a load on said clutch.

3,620,263
WIRE TENSIONER, CUTTER, AND STAPLE EXTRACTOR FOR CATTLE FENCES
Luis C. Vargas Beltran, Offcina de Correos, Puerto Armuelles, Chirqui, Panama
Filed Feb. 24, 1969, Ser. No. 801,617
Int. Cl. B21f 9/00
U.S. Cl. 140—123.6 2 Claims

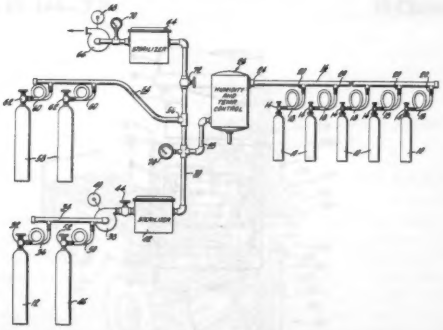
A device for drawing taut a fence wire during fence-erecting operation, the device including a pair of jaws between which the wire is grasped, one of the jaws being integral with a tubular body and the other comprising a jaw pivotable on the body, the pivotable jaw being urged into strong clamping position with the first jaw by a lever handle.

3,620,264
METHOD AND APPARATUS FOR ADDING FLUID TO FLUID-CARRYING FILLERS
Edward I. Klein, Montreal, Quebec, Canada, assignor to V-Mark Automation Ltd., Montreal, Quebec, Canada
Filed Apr. 6, 1970, Ser. No. 25,947
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—1 13 Claims

In adding fluid to fluid-absorbing fillings, a filler is positioned in a bore of a member. Fluid containing means on top of the member are connected to the bore by an opening which is centrally located with respect to a filler in the bore so that fluid in the fluid containing means passes through the opening to be absorbed by the filler. A plurality of the members can be located on an indexing table and moved past a series of work stations. At the work stations, a filler is positioned in each member, fluid is added to the fluid containing means of each member, time is provided to allow each filler to absorb the fluid and the fillers are then removed from the members.



3,620,265
METHOD FOR STERILIZING GAS CONTAINERS AND FILLING SAME WITH A STERILE GAS
Gordon N. Strople, Cherry Hill, and Justin W. Mills, Jr., Cinnaminson, both of N.J., assignors to Lif-O-Gen, Inc., Lumberton, N.J.
Continuation-in-part of application Ser. No. 765,004, Oct. 4, 1968, now abandoned. This application July 9, 1970, Ser. No. 53,394
Int. Cl. B65b 55/02
U.S. Cl. 141—8 2 Claims

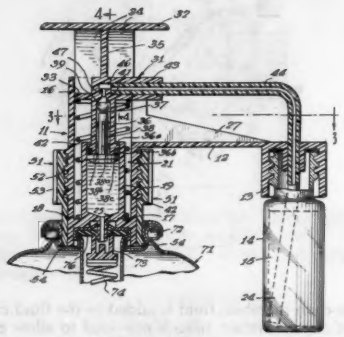


One or more gas containers connected by a conduit means to a feed source are sterilized and sterilely filled by the evacuation of the containers and conduit means to a low pressure, the introduction of a sterilizing agent into the containers and conduit means for a suitable holding period, the removal of the sterilizing agent by a further evacuation of the containers and conduit means, and the introduction of a gaseous feed stock to the containers through a sterilizing unit in the conduit means.

3,620,266
INJECTION PUMP ASSEMBLY FOR AEROSOL CONTAINERS
Francis E. Ryder, Mt. Prospect, Ill., assignor to Seymour of Sycamore Inc., Sycamore, Ill.
Filed Oct. 27, 1969, Ser. No. 869,839
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—20 9 Claims

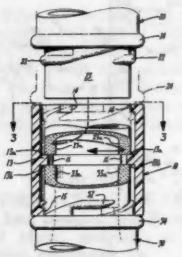
Apparatus for injecting a liquid substance into a previously filled and pressurized aerosol canister. The apparatus com-

prises a pump including means for positively locking and sealing the pump in position on the canister in surrounding relation to the valve assembly such that said pump may be



operated to withdraw liquid from a source and inject said liquid under pressure into said canister. The novel pump apparatus employs a check valve which precludes back flow during the injection procedure.

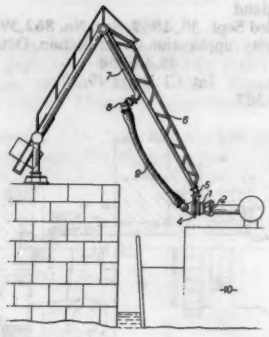
3,620,267
BOTTLE TRANSFER COUPLING DEVICE
Wendell Seablom, 3712 Texas Drive, Santa Rosa, Calif.
Filed Mar. 7, 1969, Ser. No. 805,319
Int. Cl. B65b *1/06, 3/06;* **B67c** *3/00*
U.S. Cl. 141—364 **4 Claims**



A device for transferring viscous fluids, such as catsup, from one bottle to another wherein an expansion chamber is provided between the pouring spouts of the bottles to enhance the downward flow of catsup by relieving the central portions thereof to permit air displaced from the lower bottle to bubble up through the flowing catsup into the upper bottle.

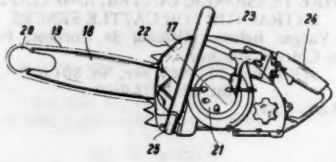
3,620,268
BOOM LOADER
Arthur Loftus Paddington, Thorpe Willoughby, near Selby, England, assignor to British Ropes Limited, Doncaster, Yorkshire, England
Filed Feb. 25, 1970, Ser. No. 14,165
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—388 **2 Claims**

A boom loader of the kind having a boom from which is suspended a pipe in which petroleum products are conveyed from ship to shore, and provided with a universal connection between a discharge manifold on the pipe and the free end of the boom by means of which bending moments, which tend



to arise where the boom is connected to the pipe, are reduced to a minimum.

3,620,269
PORTABLE CHAIN SAW WITH ANTIVIBRATION HANDLE
Alfonso Lange, Dorpfeldstrasse 8, 2000 Hamburg 52, Germany
Filed Aug. 22, 1969, Ser. No. 852,235
Claims priority, application Germany, Feb. 20, 1969, P 19 08 451.6
Int. Cl. B27b *17/02*
U.S. Cl. 143—32 **6 Claims**



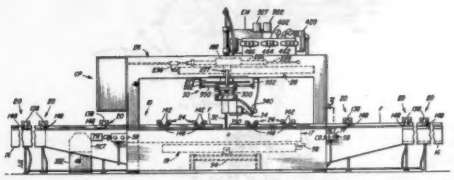
In a portable chain saw powered by a reciprocating engine, vibrations from the engine to the handle grasped by the operator(s) are absorbed by forming the handle with a core which is rigidly attached to the chain saw body and a sheath which surrounds the handle in spaced relation and held relatively to the core by a spacer of yieldable material, such as one or more pieces of rubberlike material or corrugated leaf springs or radial coiled expansion springs which engage both the core and the sheath, the latter being grasped by the operator.

3,620,270
AUTOMATED SAW
John C. Jureit, Coral Gables; Oscar Csakvary, Miami; Adolfo Castillo, Miami; Benjamin H. Kushner, Miami, and Otto J. Karch, Miami Springs, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.
Continuation of application Ser. No. 675,174, Oct. 13, 1967, now abandoned. This application Oct. 24, 1969, Ser. No. 871,629
Int. Cl. B27b *5/18, 27/06;* **B27c** *9/00*
U.S. Cl. 143—47 **57 Claims**

The fabricating machine comprises a fixed table mounting a length positioner assembly comprising a movable table having a plurality of stops spaced at predetermined intervals therealong and selectively movable for projection above the surface of the movable table. The movable table is driven lengthwise by serially disposed fluid-actuated cylinders having predetermined displacements whereby actuation of one or more of the cylinders displaces the movable table a predetermined distance from a reference point, thereby

locating the projected stop a predetermined distance from a saw blade mounted for rotation on a superstructure assembly overlying the saw table. The saw assembly is rotatably driven to a predetermined angular position by an angle positioner assembly comprising serially disposed fluid-actuated cylinders, whereby actuation of one or more of the cylinders causes the saw assembly to rotate to the predetermined angular position for making a selected angle of traverse across the saw table.

Length and angle information for actuating selected cylinders



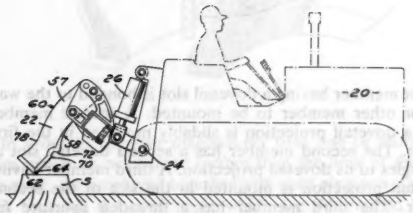
of the length and angle positioner assemblies is provided on punched tape. A tape reader senses the information and an electrical circuit is responsive thereto to provide control signals to valves controlling the fluid-actuated cylinders, whereby selected cylinders are actuated. Pullback and hold-down clamps are provided to respectively engage a board to be cut to pull the same against a rear fence and clamp the board against the table, thereby locating the board in proper sawing position and precluding movement of the board during sawing.

3,620,271

METHOD OF AND APPARATUS FOR REMOVING STUMPS

Lavern L. Loyer, 24898 Champaigne, Taylor, Mich.

Filed Feb. 9, 1970, Ser. No. 9,567
Int. Cl. A01g *23/06*
U.S. Cl. 144—2 N **10 Claims**



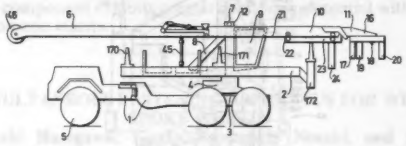
This disclosure relates to apparatus for removing tree stumps from the ground quickly and in such condition that the removed stump may thereafter be burned expeditiously as part of a land-cleaning operation. A vertically arranged blade sharpened along its bottom and forward edges and having a relatively flat face along its rear edge is mounted on a tractor in such fashion that the weight of the tractor may be utilized to force the sharpened lower edge down through the stump to split it; forward movement of the tractor will draw the sharpened forward edge of the blade through the stump to further split it; and rearward movement of the tractor combined with upward movement of the blade will pull rendered portions of the stump from the ground in a substantially dirt free condition.

3,620,272

METHOD AND MACHINE FOR FELLING, DEBRANCHING, COLLECTING AND BUNDLING TREES

Erik Helmer Eriksson, Soderhamn; Lars-Gunnar Hogberg, Ornskoldsvik; Carl Peter Seth Kempe, Ornskoldsvik, and Stig-Gunnar Lofgren, Ornskoldsvik, all of Sweden, assignors to Mo och Domsj Aktiebolag, Ornskoldsvik, Sweden

Filed Jan. 26, 1970, Ser. No. 5,885
Claims priority, application Sweden, Jan. 27, 1969, 1053/69
Int. Cl. A01g *23/02*
U.S. Cl. 144—3 D **23 Claims**



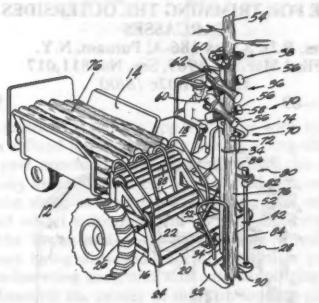
Apparatus and process are provided for felling, debranching, collecting and bundling trees, in which the tree is gripped, cut, and felled to a position substantially parallel with the ground, in one continuous working sequence, and is then immediately transported in its longitudinal direction through a debranching means in which the branches are separated from the trunk or a portion thereof. The debranched trunk or portion is severed, and is conveyed crosswise to a collection means, and bundled.

3,620,273

TREE HARVESTING APPARATUS

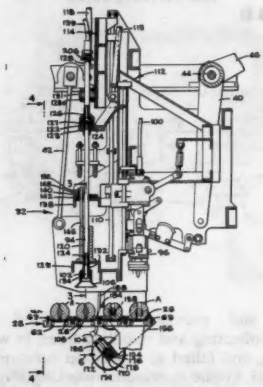
Robert L. Propst, 2347 Londonderry Ave., Ann Arbor, Mich.

Filed May 25, 1970, Ser. No. 40,162
Int. Cl. A01g *23/02*
U.S. Cl. 144—3 D **10 Claims**



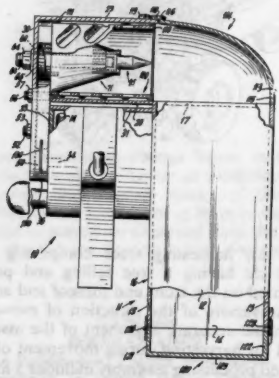
Apparatus for harvesting trees comprising a forwardly movable vehicle having a tree felling and processing assembly mounted on the front end thereof and adjustable in a direction transversely of the direction of movement of the vehicle to enable accurate alignment of the assembly with a tree selected for harvesting during movement of the vehicle. The felling and processing assembly includes a lower severing mechanism and a mast which extends upwardly therefrom and is movable between vertical and inclined positions. The assembly also includes a tree gripping and feeding assembly consisting of pairs of elongated concave surfaced rollers which grip the tree and are operable to feed the tree downwardly so that it can be cut off into lengths. The tree lengths are then bucked onto a conveyor which moves them to a storage receptacle on the vehicle.

3,620,274
FRUIT ALIGNING APPARATUS
Gerald R. Anderson, Campbell, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Jan. 22, 1970, Ser. No. 5,074
Int. Cl. A23n 3/12
U.S. Cl. 146—52 9 Claims



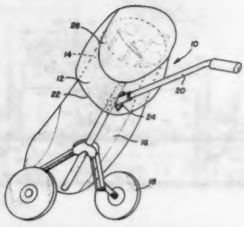
Indented fruit such as apples are oriented with their stem indents down on a cup conveyor. To improve and maintain this orientation, a rotatable stem indent centering pin moves upwardly into the indent and a rotatable blossom indent centering pin moves down into the blossom indent. The bottom centering pin lifts the fruit out of the cup, and the two centering pins are rotated in opposite directions. This rotation causes the fruit to shift into precise alignment with the centering pins, and a spring-biased centering cup coaxial with the upper centering pin preserves this alignment while the centering pins retract, and during the next following stemming operation.

3,620,275
DEVICE FOR TRIMMING THE OUTERSIDES OF CARCASSES
Paul R. Himes, R.D. 3, Box 186-A, Putnam, N.Y.
Filed Mar. 27, 1969, Ser. No. 811,017
Int. Cl. B02c 18/00
U.S. Cl. 146—89 9 Claims



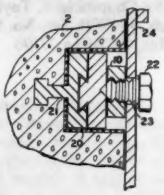
The device can be hung by means of a flexible cord. It is portable and operated by an electric motor. The motor output shaft is geared to a rotary cylindrical cutter. The device is held by a handle and moved to run the cylindrical cutter over the outside of the carcass. Fat and grime is cut by knives on the cutter and the cuttings move to the inside of the cylinder and are pushed into a container on the device. The container has a cover which can be opened to dump the cuttings. A conical member fixed within the cylindrical cutter guides cutting to the open end of the cutter.

3,620,276
GOLF BAG SLIP COVER
Clarence R. Taylor, 28 Woodside Drive, Penfield, N.Y.
Filed Sept. 5, 1969, Ser. No. 855,700
Int. Cl. A63b 55/00
U.S. Cl. 150—52 G 7 Claims



A slip cover for a golf bag and clubs to protect them from moisture during a sudden shower or rain storm. The slip cover has a discontinuity along one end thereof to receive the handle of a golf cart containing the golf bag and clubs, and a cover flap at its other end to provide access to the golf clubs.

3,620,277
MEANS FOR MOUNTING CONCRETE STRUCTURAL MEMBERS
Natale J. Tummarello, 2073 Hillside Ave., Bellmore, N.Y.
Filed Mar. 30, 1970, Ser. No. 23,802
Int. Cl. F16b 37/04
U.S. Cl. 151—41.76 1 Claim

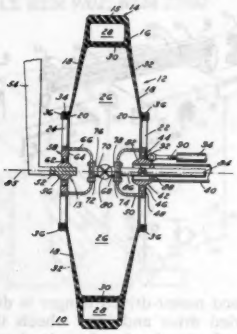


A first member having a dovetail slot is bonded to the wall panel or other member to be mounted. A second member having a dovetail projection is slidably mounted in the first member. The second member has a second dovetail slot at right angles to its dovetail projection. A third member having a dovetail projection is mounted in the slot of the second member. The third member has a threaded aperture for receiving a mounting bolt. The dovetail means provides adjustment of the mounting aperture along two axes.

3,620,278
HYBRID PNEUMATIC-MECHANICAL VARIABLE CONFIGURATION WHEEL
Edward G. Markow, Oakdale, N.Y., assignor to The United States of America as represented by the Secretary of the Army
Filed Dec. 16, 1969, Ser. No. 885,523
Int. Cl. B60b 9/00
U.S. Cl. 152—9 10 Claims

A variable-geometry-type vehicle wheel whose profile can be automatically changed as required from a circular configuration for normal operation on roads to an elliptical configuration for off-the-road travel to increase traction. The

profile of the wheel, formed with a flexible pneumatic spoke membrane and resilient rim is changed from a circular shape

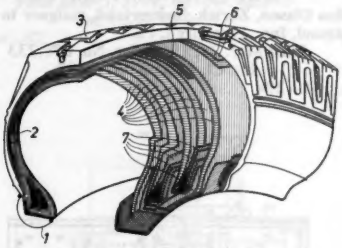


to an elliptical shape by canting the wheel hub disks relative to the wheel shaft centerline.

3,620,279
PNEUMATIC TIRES

Zoltan Bartha; Laszlo Vad; Imre Biro, and Otto Farkas, all of Budapest, Hungary, assignors to Orszagos Gumiipari Vallalat, Budapest, Hungary

Filed July 15, 1969, Ser. No. 841,738
Int. Cl. B60c *9/02*
U.S. Cl. 152—356 **3 Claims**



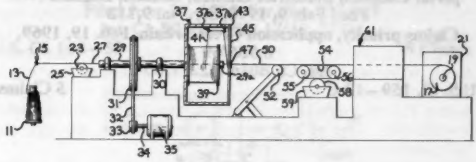
In order to improve diagonal-ply tires one or more zone plies which do not extend further than the limit of the flexible zone, are employed together with cord elements with certain limits of the cord angle which are determined by the shaping angle and by the direction of the cord elements.

3,620,280
MULTIFILAMENT REINFORCEMENT YARNS AND ARTICLES CONTAINING SAME

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation

Filed Apr. 16, 1968, Ser. No. 721,688
Int. Cl. B60c *9/02;* **D02g** *3/36, 3/48*
U.S. Cl. 152—359 **15 Claims**

Organic and glass filaments, yarns and/or strands are combined, with the organic component as the core and the glass component as the overwrap, followed by a treatment which causes the organic to shrink, causing spaced portions of the glass component to move or to tend to more radially outwardly with respect to the longitudinal axis of the combined structure and whereby, when the combined structure is in an elastomeric matrix, the region of the matrix contiguous to the organic component is in a state of compression while the

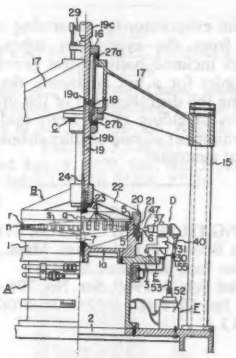


glass component exhibits greater anchoring potential with the elastomeric matrix.

3,620,281
SIMULTANEOUS FASTENING APPARATUS FOR WIRE SPOKE WHEELS

Kazuaki Hasegawa; Kanzo Kawaguchi Nozaki, and Katsuyoshi Yokoyama, all of Tokyo, Japan, assignors to Japan Bicycle Promotion Institute, Tokyo, Japan

Filed Dec. 30, 1969, Ser. No. 889,119
Claims priority, application Japan, Apr. 21, 1969, 44/35778
Int. Cl. B60b *1/04*
U.S. Cl. 157—1.55 **4 Claims**



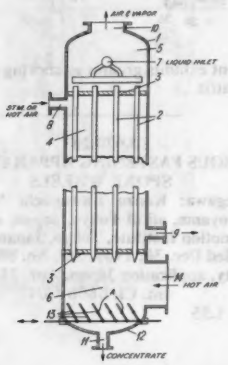
A simultaneous fastening apparatus for wire spoke wheels comprises a fixed lower assembly having a ring-shaped spoke inserting part provided with slots into which the spokes of a provisionally assembled wheel are inserted and vertical teeth between the slots, an annular rim-loading part on which the rim of said wheel is loaded, and an axle-supporting part for gripping the lower end of an axle of said wheel, said rim-loading part being disposed beneath the outer periphery of said spoke-inserting part, and said axle-supporting part being disposed beneath the center of said rim-loading part and said spoke-inserting part. An upper assembly movable in the vertical direction has an annular rim-clamping part provided with a tapered surface along the lower portion of its outer periphery for making contact with the rim of said wheel and a vertical guide surface along the lower portion of its inner periphery for making contact with the outer periphery of said teeth, and an axle-supporting part for gripping the upper end of the axle of said wheel, said supporting part being disposed at the center of said clamping part. Driver devices equal to the number of nipples threadedly mated with the tips of the respective spokes of the wheel are positioned to oppose each of the slats of said lower assembly at its outer peripheral position and are reciprocable in the directions of the spokes of the wheel. First driving means are positioned for reciprocating the upper assembly in the vertical direction; second driving means are positioned for rotating the driver devices in the fastening direction of the nipples with a constant torque; and third driving means are positioned for reciprocating the driver devices in the directions of the spokes.

3,620,282

FALLING FILM EVAPORATOR FOR CONCENTRATING LIQUIDS

Frank Newton, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 9, 1970, Ser. No. 9,712
Claims priority, application Great Britain, Feb. 19, 1969, 8,935/69
Int. Cl. B01d *1/22, 1/00*
U.S. Cl. 159—13 C 5 Claims



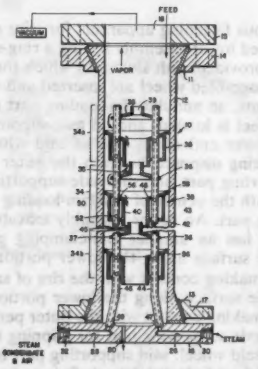
In a falling film evaporator for separating or concentrating liquids, drops from the evaporator tubes fall onto and between parallel inclined baffle plates provided below said tubes and the inlet for a hot airstream, the inclined baffle plates minimizing the disintegration of the drops into smaller droplets and, by shielding them from said hot airstream, minimizing entrainment of said smaller droplets back up said tubes by said hot airstream.

3,620,283

FALLING FILM EVAPORATOR STRIPPER

Francis Charles Brown, Framingham, Mass., assignor to Artisan Industries Inc., Waltham, Mass.

Filed Feb. 4, 1969, Ser. No. 796,416
Int. Cl. B01d *1/22, 3/08, 3/00*
U.S. Cl. 159—13 A 9 Claims



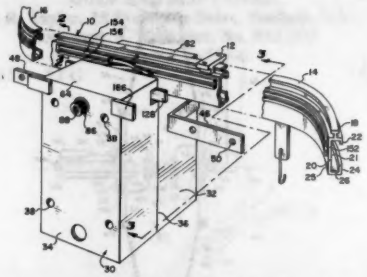
A falling film evaporator which includes an alternating series of tubular heat jackets and discs, which units are vertically and spatially separated within the column. The discs are characterized by a central flow passage therein. The inner circumference of the heated tubular jacket is less than the diameter of the disc directly below it. The upper portion of the tubular jacket has an inwardly and downwardly dished flange the outer circumference of which is greater than the peripheral edge of the disc directly above it.

3,620,284

REMOTE CONTROLLED TRAVERSE ASSEMBLY

Charles A. Shayman, 1130 So. Michigan Ave., Chicago, Ill.

Filed Aug. 19, 1970, Ser. No. 65,220
Int. Cl. A47h *5/02*
U.S. Cl. 160—331 19 Claims



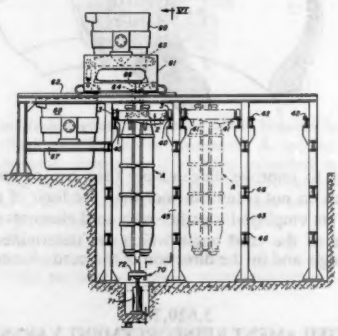
An enclosed motor-driven hanger is disclosed having opposing knurled drive and idler wheels that engage on opposite sides of a track whereby a load can be carried along the track or the leading edge of a curtain can be moved to an open or closed position along the track through rotation of the drive wheel. In one embodiment the idler wheels are spring loaded and mounted on a wobble plate while the drive wheel is fixed. In another embodiment the drive wheel is adjustably spring mounted and the idler wheels are on fixed axes. In either embodiment, the track carries spaced insulated conductors, the motor mount has sliding, electrical contacts that engage the conductors and the assembly is adapted to traverse curved, horizontal or inclined tracks with facility and underload. Provision is made for ready adjustment of the tension on the compression force upon the track by the opposing drive and idler wheels, instant fingertip release from the track as desired, and easy disassembly for repair or replacement of parts. Vertically oriented tracks having curved sections can also be traversed with facility by the unit.

3,620,285

SLAB CASTING APPARATUS

Erik Allan Olsson, Zurich, Switzerland, assignor to Olsson International, Inc., Pittsburgh, Pa.

Filed Mar. 21, 1969, Ser. No. 809,233
Int. Cl. B22d *9/00, 11/08*
U.S. Cl. 164—274 14 Claims



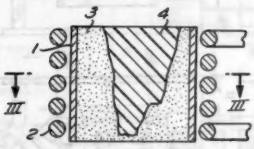
Apparatus for casting in succession a plurality of metal slabs of fixed length wherein there is a single open-ended casting mold and a number of supporting units of the type having opposed panels in which the cast slabs are cooled. The opposed panels of each supporting unit are reciprocated up and down during the casting in such manner that one moves up as the other moves down, and are similarly reciprocated to facilitate removal of the casting from the supporting unit. The supports are each suspended from a carriage in such manner that when one slab has been cast, it may be moved away and another brought beneath the mold, or the mold moved to position over another supporting unit.

3,620,286

CASTING METHOD

Richard Hofmann, 6346 Oberscheid, and Adalbert Wittmoser, 684 Lampertheim, both of Germany

Division of Ser. No. 680,698, Nov. 6, 1967, abandoned
Filed June 18, 1969, Ser. No. 834,300
Int. Cl. B22c 9/02; B22d 27/02
U.S. Cl. 164—34 26 Claims



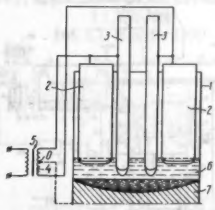
A casting method using a mold of particulate material including magnetizable particles which is made shape-retaining by subjecting the shaped mold to a magnetic field of sufficient strength to fix the position of the particulate magnetizable mold-forming material.

3,620,287

METHOD OF PRODUCING INGOTS, IN PARTICULAR, SLAB INGOTS, BY ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Izrailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8; Vitaly Mikhailovich Baglai, ulitsa Semasha, 10, kv. 54/3; Albert Nikolaevich Sevruk, ulitsa Ezhena Potie, 9, kv. 3, and Jury Vadimovich Latash, Vozdukhoflotsky prospekt, 81, kv. 14, all of Kiev, U.S.S.R.

Filed June 3, 1970, Ser. No. 42,913
Int. Cl. B22d 27/02
U.S. Cl. 164—52 5 Claims



This disclosure relates to a method of producing ingots, in particular, slab ingots, by electroslag remelting of consumable electrodes.

The method according to the present invention consists in the introduction to a cooled crystallizer of two groups of consumable electrodes, each of said groups comprising one electrode, stationary with respect to the crystallizer, and at least one movable electrode, which helps ensure a high quality of slab ingots produced.

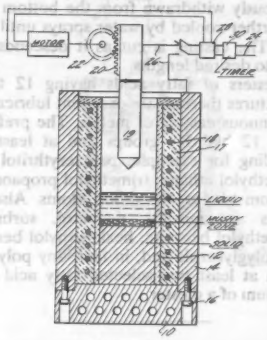
This method can be most advantageously used for producing slab ingots intended for direct sheet rolling without the use of powerful cogging means.

3,620,288

DIRECTIONALLY SOLIDIFIED CASTINGS

Robert B. Barrow, Chesire, and Jeffrey D. Hostetler, Middletown, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 27, 1969, Ser. No. 837,247
Int. Cl. B22d 27/02, 17/32, 27/04
U.S. Cl. 164—52 8 Claims



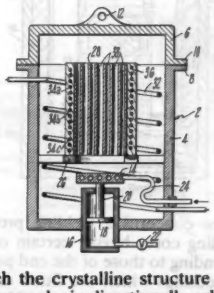
Production of directionally solidified castings using a consumable arc melting technique with cooling from the base of the apparatus by periodically interrupting the arc.

3,620,289

METHOD FOR CASTING DIRECTIONALLY SOLIFIED ARTICLES

Charles M. Phipps, Jr., Wapping, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 750,335, Aug. 5, 1968, Pat. No. 3,538,981
Filed Apr. 1, 1970, Ser. No. 31,458
Int. Cl. B22d 25/06, 27/20
U.S. Cl. 164—60 9 Claims



Articles in which the crystalline structure is directionally controlled as, for example, in directionally solidified or single crystal articles are cast in individual molds with a mechanism to control the cooling rate and direction such that orientation of the crystalline structure is precisely controlled. A graphite susceptor surrounds the individual molds and in cooperation with a chill plate provides the necessary control of the cooling rate and direction.

3,620,290

LUBRICANTS FOR CONTINUOUS METAL-CASTING OPERATIONS

Bernard H. Kress, Lafayette Hill, and Donald E. Alexander, Wayne, both of Pa., assignors to Quaker Chemical Corporation, Conshohocken, Pa.

Continuation-in-part of application Ser. No. 734,572, June 5, 1968, now Patent No. 3,526,596, dated Sept. 1, 1970. This application Apr. 6, 1970, Ser. No. 26,138
Int. Cl. C10m 1/26
U.S. Cl. 164—73 7 Claims

The invention relates to synthetic lubricants used at very high temperatures in the process of continuous casting of

molten metals. The lubricants are applied as a liquid film to the surfaces of the molds into which the metal is poured. In continuous casting of steel the molten steel is poured into an open-bottomed mold of the desired product shape. The steel is cooled in the mold just enough to harden the exterior surface of the casting, which forms a shell or container that holds the balance of the liquid metal. The inner walls of the mold are continuously coated with a liquid lubricant as the metal is poured therein. The partially solidified casting is then continuously withdrawn from the bottom of the mold, where it is further cooled by water sprays until all the metal is solidified. The casting is cut as it descends through the equipment into desired lengths.

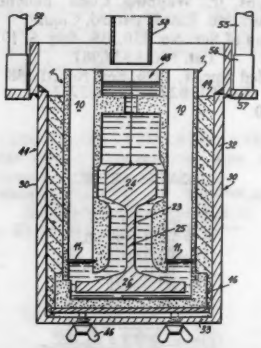
The polyol esters of fatty acids having 12 to 22 carbon atoms, or mixtures thereof, are excellent lubricants for molds used in continuous casting of metals. The preferred polyols have two to 12 hydroxy groups and at least five carbon atoms, including for example, pentaerythritol or polymers thereof, trimethylol ethane, trimethylol propane, and glycols containing from two to 40 carbon atoms. Also included in these polyols are inositol, mannitol, sorbitol, glucose, sucrose, trimethylol benzene, hexamethylol benzene, methyl glucosides, polyglycerols and, in fact, any polyol capable of reacting with at least two selected fatty acid molecules to form a minimum of a diester.

3,620,291

PROCESS FOR ALUMINOTHERMAL WELDING

Marcel Joseph Charles Delachapelle, Aillant-sur-Tholon (Yonne), France

Filed Nov. 19, 1969, Ser. No. 878,083
Claims priority, application France, Nov. 19, 1968, 174,408
Int. Cl. B22d *19/00*
U.S. Cl. 164—108 **3 Claims**



The disclosure concerns a welding process utilizing apparatus comprising cores having certain of their faces with shapes corresponding to those of the end parts of the sections to be joined, housings which are fitted on the parts of the sections to be joined which extend outside the cores, a fusible cutoff element closing the exit from the cores, a rigid support fittable on the housings and a hearth capable of being maintained in stable position on the support. The process includes the step of forming a mold in situ by the ignition of a mixture of aluminothermal material and refractory material, and then adding a first fraction of molten material to the mold, after a period of time releasing the first fraction and adding a second fraction of molten material to the mold so as to weld the abutting ends of the sections to be joined.

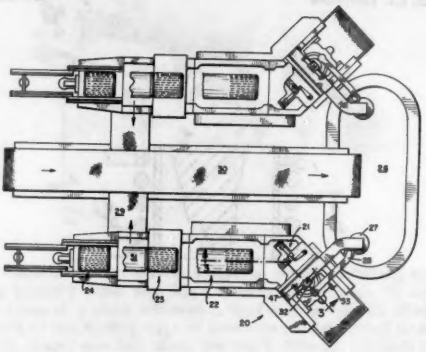
3,620,292

AUTOMATIC STEREOTYPE PLATE CASTING AND FINISHING MACHINE

Charles L. Ricards, South Plainfield, N.J., assignor to Wood Industries, Inc., Plainfield, N.J.

Filed Sept. 15, 1969, Ser. No. 857,825
Int. Cl. B41d *3/00*
U.S. Cl. 164—140 **13 Claims**

A new stereotype plate casting and finishing machine is disclosed having a dual arrangement of the various sections, each of two casting units being arranged, together with cooperating transfer units at an angle with respect to subsequent parallel inspection, finishing and cooling sections.



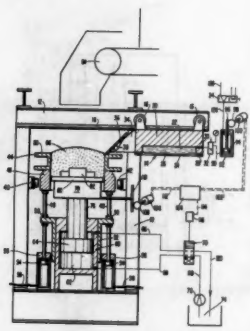
Unique transfer means are disclosed for carrying newly cast plates from each of the respective casting units and for presenting the plates at inspection stations where an operator can inspect the newly cast plate.

3,620,293

PRESS MOLDING MACHINE WITH ADJUSTABLE FEED DEVICE

Ernst Otto Kruse, Pattenser Str. 48, Reden/Hannover, Germany

Filed Apr. 7, 1969, Ser. No. 814,040
Int. Cl. B22c *19/04, 15/08*
U.S. Cl. 164—154 **5 Claims**



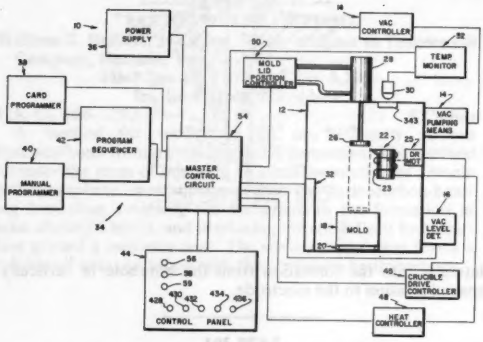
A desired degree of compaction of molding sand within a mold flask part is achieved by ramming a pressure plate to a fixed end position with respect to the mold flask part while bleeding liquid from a yielding pressure head to allow attainment of the end position without exceeding the desired degree of compaction. The amount of molding sand subjected to compaction in the next cycle is controlled by the amount of liquid so displaced.

3,620,294

SEMIAUTOMATIC METAL CASTING APPARATUS

Frank L. Hetzel, Manhattan Beach, and Stuart T. Schy, Reseda, both of Calif., assignors to TRW Inc., One Space Park, Redondo Beach, Calif.

Filed July 11, 1969, Ser. No. 841,019
Int. Cl. B22d 37/00
U.S. Cl. 164—155 20 Claims



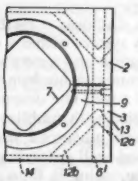
A program-controlled semiautomatic metal casting process and apparatus involving a series of successive working and checking operations, including preliminary semiautomatic startup operations and final fully automatic melting, pouring, and shutdown operations. Commencement of each operation requires proper completion of the preceding operation. Certain of the operations proceed in accordance with a preselected casting program which may be varied, either by total program substitution or by manual adjustment of the individual program parameters, to provide the optimum program for the particular metal being poured and the particular shape being cast.

3,620,295

CONTINUOUS CASTING MOLD HAVING A PLURALITY OF TRANSVERSE COOLING PASSAGES

Richard James Dain, Tonbridge, Kent, England, assignor to Davy-Ashmore Limited, London, England

Filed Mar. 11, 1969, Ser. No. 806,165
Claims priority, application Great Britain, Mar. 12, 1968, 11,885/68
Int. Cl. B22d 11/00
U.S. Cl. 164—283 6 Claims



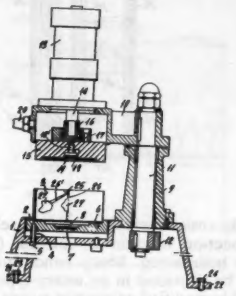
A mould for use with a continuous casting machine comprises a body of thermally conductive material having an opening therethrough and the walls of the opening constitute the mould surface. The body is made up of a plurality of parts each of which provides part of the mould surface along the length of the opening and each part of the body has separate liquid cooling ducts or passages. The quantity of fluid passed for cooling purposes through the different parts of the body can be adjusted to give the required heat transfer conditions between the molten metal passed through the mould and the mould body.

3,620,296

MACHINE FOR OBTAINING METAL CASTINGS

Ugo Barbieri, Via De Pretis 5, Pavia, and Giancarlo Dal Pra, Via Matteotti 2, Peschiera Borromeo, Milan, both of Italy

Filed Nov. 5, 1969, Ser. No. 874,278
Claims priority, application Italy, Dec. 4, 1968, 24,591/68
Int. Cl. B22d 17/06
U.S. Cl. 164—308 10 Claims



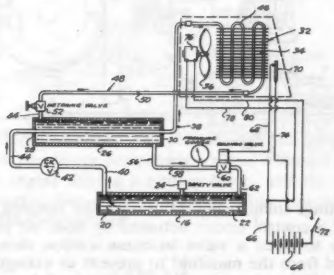
A method for providing metal castings by using disposable wax dies, comprising through a predetermined and completely automatic cycle a previous degassing step of the die by sucking from the bottom and then the pouring step of the molten metal by a combination of suction from the bottom and pressure from the top on said die, the pressure being applied when degassing approaches the molten metal in the die pot.

3,620,297

COOLING SYSTEM

Orville Adkins, 313 Center St., New Richmond, Ohio

Filed Dec. 12, 1969, Ser. No. 884,628
Int. Cl. B60h 3/04
U.S. Cl. 165—23 1 Claim



A closed system for cooling wherein a substance is vaporized by a heat source and conducted to a condenser. From the condenser, the substance enters coils in an evaporator, from which it is returned to the condenser and to the heat source.

3,620,298

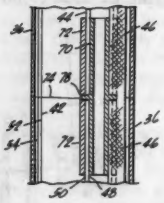
CONTINUOUS HEAT PIPE AND ARTERY CONNECTOR THEREFOR

Robert H. Somerville, Richland, and Lewis P. Bakker, Kennewick, both of Wash., assignors to McDonnell Douglas Corporation

Filed July 22, 1970, Ser. No. 57,041
Int. Cl. F28d 15/00
U.S. Cl. 165—105 10 Claims

Continuous, annular, artery-type wick heat pipe is obtained by forming a predetermined length of container tube including an artery-type wick therein into a desired annular configuration and joining abutting artery ends with a connec-

tor means comprising an insert and two securing spring sleeves, the joint being completed by butt welding the ends of the outer container tube together. The insert and spring sleeves of the connector means have cooperating configura-



tions and dimensions which provide a self-aligning and firm artery connection wherein an integral (nonleaking) artery structure is maintained. Sharp bends such as a right angle corner can be provided in an artery-type wick heat pipe by use of suitably modified connector means.

3,620,299

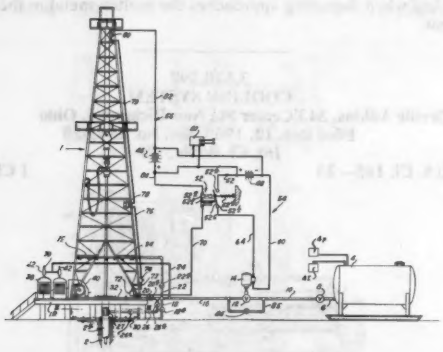
DEVICE FOR PUTTING OUT OIL WELL FIRES

Ben W. Wiseman, Jr., 303 Wall Tower-West, Midland, Tex.

Filed Jan. 24, 1969, Ser. No. 793,692

Int. Cl. A62c *35/40, 37/04;* **F21b** *35/00*

U.S. Cl. 166—.5 **15 Claims**



An extinguishing manifold around the opening of an oil well and a control circuit actuated by heat, air pressure or manually to open a valve to cause carbon dioxide to be dispensed from the manifold to prevent or extinguish an oil well fire. The carbon dioxide may also be injected into the well casing, and used to cool the exhaust pipes of engines at the well site. On an offshore rig, the carbon dioxide container is attached to a leg of the platform, below water.

3,620,300

METHOD AND APPARATUS FOR ELECTRICALLY HEATING A SUBSURFACE FORMATION

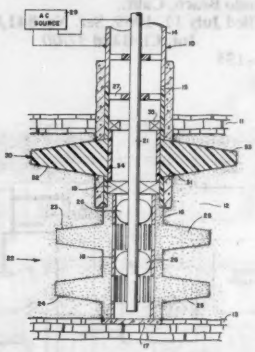
Fred L. Crowson, Portland, Tex., assignor to The Electrothermic Co., Corpus Christi, Tex.

Filed Apr. 20, 1970, Ser. No. 29,954

Int. Cl. E21b *43/24*

U.S. Cl. 166—248 **22 Claims**

A method and apparatus include providing one or more vertically spaced electrodes in the borehole in electrical contact with the formation. Two electrodes in a common borehole may be connected to a surface source of alternating current voltage to conductive paths provided respectively by a conductive casing and a conductive tubing suitably insulated from each other; or the two electrodes connected to the voltage source may be placed in separate adjacent boreholes. The flow of current through the formation is guided or directed by means of insulating barriers which extend



laterally into the formation from the borehole in vertically spaced relation to the electrode.

3,620,301

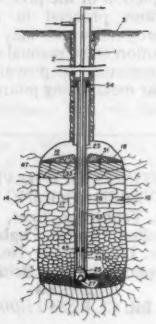
METHOD OF IN-SITU-RETORTING OIL SHALE

Dean P. Nichols, Dallas, and Lloyd K. Strange, Grand Prairie, both of Tex., assignors to Mobil Oil Corporation

Filed Apr. 13, 1970, Ser. No. 27,887

Int. Cl. E21b *43/24, 47/06*

U.S. Cl. 166—251 **6 Claims**



This specification discloses a method of forming a single-well in-situ-recovery system within a nuclear chimney formed in an oil shale formation and a method of in-situ-retorting oil shale within the chimney. A nuclear explosive is positioned at the lower portion of a well and detonated to form the nuclear chimney which is filled with rubblized oil shale. A bit is connected to casing and advanced through the rubblized oil shale to form a cased well extending to the lower extremity of the chimney. The casing is then perforated and a single-well in-situ-retorting process is carried out.

3,620,302

SEALING PERMEABLE ZONES IN SUBTERRANEAN FORMATIONS WITH HEAT-SENSITIVE SOLUTIONS

Robert W. Parsons, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sept. 12, 1969, Ser. No. 857,565

Int. Cl. E21b *33/138, 43/24*

U.S. Cl. 166—258 **7 Claims**

The permeability of permeable zones in a subterranean formation is reduced by injecting into the formation an aqueous solution containing plugging agents which swell or foam when heated, and then heating these agents to a temperature

sufficient to cause them to intumesce. Examples of useful plugging agents include soluble metal silicates. The reservoir can be heated by any of several means, e.g. a standard downhole heater, igniting charcoal briquettes, or with heat generated by in-situ combustion process, e.g. in-situ combustion process can be maintained in a zone adjacent to the permeable zone to be sealed.

3,620,303
TAR RECOVERY METHOD
William G. Halbert, Jr., Butte, Mont., assignor to Tenneco Oil Company, Houston, Tex.
Filed Jan. 15, 1970, Ser. No. 3,225
Int. Cl. E21b *43/22, 43/24*
U.S. Cl. 166—272 **5 Claims**

A method for recovering tar or extremely viscous hydrocarbons from an underground formation. The method includes the steps of injecting an aqueous solution of anionic orthophosphate ester surfactant into the hydrocarbon-bearing formation, retaining the surfactant in the formation at least about 24 hours, and displacing the solubilized hydrocarbon toward a recovery well. The surfactant solution forms a soluble oil microemulsion with the formation hydrocarbons.

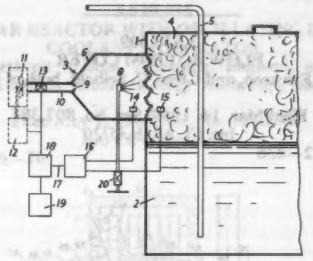
3,620,304
OPTIMUM OIL RECOVERY FOR CARBON DIOXIDE INJECTION
Charles L. Hearn, and Charles S. Holmes, both of Tulsa, Okla., assignors to Cities Service Oil Company
Filed Dec. 10, 1969, Ser. No. 883,818
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **4 Claims**

Carbon dioxide is injected into a subterranean oil reservoir to maintain a reservoir pressure between about 1 and about 250 p.s.i. above the bubble point pressure of the reservoir crude oil. Under predetermined conditions of temperature and pressure the carbon dioxide miscible gas recovery provides for an extremely efficient displacement of the reservoir crude oil. It has been found that at pressures slightly above the bubble point pressure of the reservoir fluid, the rate of solubility of the carbon dioxide in the reservoir fluid is much higher and recovery of oil is more efficient.

3,620,305
STIMULATION AND SELECTIVE PLUGGING OF PETROLEUM RESERVOIRS
Richard S. Fulford, Tulsa, Okla., assignor to Cities Service Oil Company
Filed Jan. 19, 1970, Ser. No. 4,098
Int. Cl. E21b *43/27*
U.S. Cl. 166—282 **16 Claims**

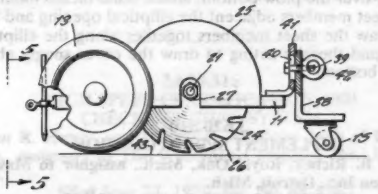
Fractures or highly permeable streaks in a reservoir containing kaolinite are selectively plugged by the introduction of a solution containing an organic carbonyl group containing compound. The solution attacks the kaolinite containing particles of the fractures or permeable streaks and decomposes the clay mineral bonds of the rock matrix. The decomposition process causes the walls of the pores to disintegrate and form individual grains of fine clay particles. Subsequent addition of treatment solution transposes the disintegrated particles and lodges them in the exposed pores of the fractures or permeable streaks. Further flow through the treated area is restricted and the reservoir is selectively plugged. Less permeable areas of the reservoir are somewhat stimulated by the kaolinite breakup with the dislodged clay particles from those areas seeking the more permeable channels in the reservoir and further plugging them. The reservoir is thereby both selectively plugged and stimulated by the solution treatment and the reservoir performance is enhanced.

3,620,306
MEANS FOR FOAM GENERATION
Denis Shepherd, South Harrow, England, assignor to Walter Kidde & Company, Inc., Belleville, N.J.
Filed Jan. 14, 1969, Ser. No. 791,006
Int. Cl. A62c *35/00*
U.S. Cl. 169—15 **11 Claims**



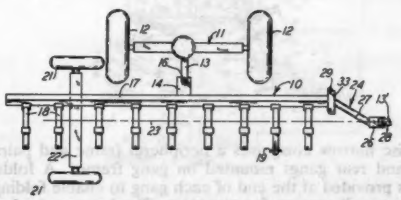
A method and means of generating high expansion foam by spraying foaming agent onto a mesh through which gas (usually air) is blown. Pressure sensors on either side of the mesh sense the pressure differential across the mesh and through control means ensure a constant pressure differential despite changes in back pressure.

3,620,307
GOLF COURSE GREEN OR YARD BORDER CUTTER
Antone Vilela, R.R. #1, Box 293A, Kapaa, Kauai, Hawaii
Filed Oct. 13, 1969, Ser. No. 865,815
Int. Cl. A01b *45/00*
U.S. Cl. 172—15 **2 Claims**



An improved lawn edger used particularly for edging a golf course green, the device comprising a wheel mounted chassis carrying an engine driving a cutting blade, and the chassis carrying a cutting-line guide which is in alignment taken by the path of the cutting blade.

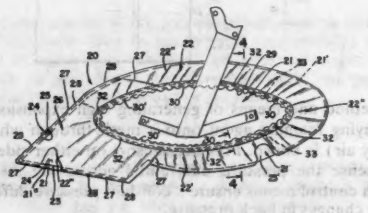
3,620,308
TOWING MEANS FOR AGRICULTURAL IMPLEMENT
John G. Christopher, Grinnell, Iowa, assignor to J. I. Case Company, Racine, Wis.
Filed Sept. 10, 1969, Ser. No. 856,692
Int. Cl. A01b *23/04*
U.S. Cl. 172—248 **1 Claim**



An agricultural implement, such as a cultivator, having a frame and two draft means or tongues. One of the tongues serves to move the implement in one direction during operation, and the other of the tongues serves to move the imple-

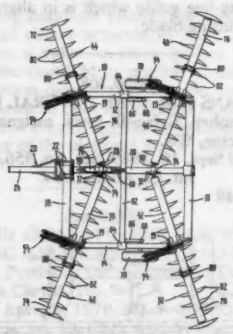
ment in another direction during transport. Transport wheels are affixed to the implement and are offset relative to the main frame of the implement. Accordingly, the second draft means is swingable on the frame and between a lowered position for transport, and aligned on the vertical plane centrally of the wheels when the draft means is in the downwardly swung position. The draft means is also swung upwardly to the inoperative position to overlie the implement.

3,620,309
PLOW BOTTOM COVER
Charles R. Erickson, and Glenn C. Seibold, both of Cleveland, N. Dak.
Filed Mar. 14, 1969, Ser. No. 807,387
Int. Cl. A01b *35/20*
U.S. Cl. 172—438 **1 Claim**



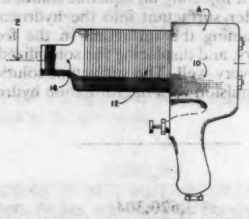
The invention comprises a plow bottom cover adapted to be fitted over a plow bottom having a pair of flexible fabric sheet members attached together, one of said sheet members covering the outside working surface of the plow bottom, the other sheet member covering the portions of the inside surface of the plow bottom, the sheet members together forming an elliptical opening along the inside surface for mounting the cover over the plow bottom, elastic band means mounted to the sheet members adjacent the elliptical opening and acting to draw the sheet members together along the elliptical opening and thereby acting to draw the cover snugly about the plow bottom.

3,620,310
IMPLEMENT SPRING CUSHION
Clarence B. Richey, Royal Oak, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.
Filed July 22, 1969, Ser. No. 843,477
Int. Cl. A01b *23/04, 21/08*
U.S. Cl. 172—600 **3 Claims**



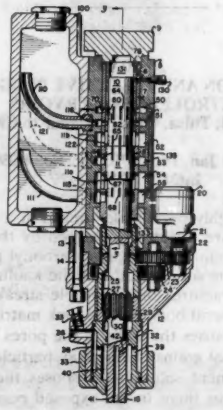
A disc harrow comprises a peripheral frame and pairs of front and rear gangs mounted on gang frames. A foldable wing is provided at the end of each gang to enable folding to a narrower dimension for transport. The inner end of each gang frame mounts a plate having a threaded aperture that receives a bolt pivotally mounted on the implement pull tube. This permits pivotal movement of the gang frame about its longitudinal axis. Each gang frame projects outwardly through a rectangular aperture in the corner of the peripheral frame. A lever centrally pivoted to the peripheral frame corner engages the gang frame at one end. A compression spring unit pivoted to the frame corner is pivoted to the other end of the lever. As the discs encounter an obstruction, the gang frame pivots to lift the discs over the obstruction. This pivots the lever which compresses and pivots the spring unit such that increasing spring compression decreases the lever arm at which the spring acts on the lever. This provides a constant spring force resisting the pivotal movement of the gang frame.

3,620,311
AIRHAMMER CONSTRUCTION
Lowell N. Brown, 11612 Bowling Green, St. Louis County, Mo.
Filed July 15, 1970, Ser. No. 54,892
Int. Cl. B23b *45/04*
U.S. Cl. 173—136 **8 Claims**



This invention relates to an airhammer, the barrel of which is constructed by assembling in axial registration a plurality of stamped discs, each held in axial registration by a pair of aligning rods, and each provided with complementary apertures which define the necessary air passages and piston chamber.

3,620,312
ROCK DRILL
Eugene L. Krasnoff, Princeton, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.
Continuation-in-part of application Ser. No. 728,854, May 13, 1968, now abandoned which is a continuation of Ser. No. 629,561, Apr. 10, 1967, abandoned. This application May 22, 1969, Ser. No. 826,923
Int. Cl. E21c *3/20, 3/30*
U.S. Cl. 173—138 **15 Claims**



A hydraulically powered impact tool particularly useful for rock drilling. The percussive tool is valveless with the hammer controlling the inflow and exhaust of motive liquid. The drill is powered by liquid under pressure from an outside source and from energy stored in storage chambers. Tanks positioned in the inlet and exhaust lines of the tool reduce pressure surges in the inlet and exhaust lines of the tool.

3,620,313

PULSED HIGH-PRESSURE LIQUID PROPELLANT COMBUSTION-POWERED LIQUID JET DRILLS

Lester C. Elmore, Portola Valley, and Thomas M. Broxholm, Palo Alto, both of Calif., assignors to Pulsepower Systems Incorporated

Filed Oct. 27, 1969, Ser. No. 869,660
Int. Cl. E21b 7/18
U.S. Cl. 175—14 21 Claims

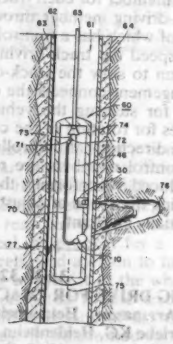
A liquid propellant is burned in the bulk mode and in pulses to produce high combustion pressures with large power outputs. The pulsed high-pressure liquid propellant combustion is used in combination with a liquid jet drill to eject high-velocity and high-pressure jets of liquid from liquid jet nozzles in the drill for erosion drilling. The high combustion pressures produced by burning the liquid propellant in the bulk mode and in pulses may be used to overcome high-back pressures such as those existing at deep drilling depths and in deep ocean depths.

3,620,314

COMBINATION BULLET-PERFORATING GUN AND SHAPED CHARGE PERFORATOR APPARATUS AND METHOD

Floyd O. Bohn, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 16, 1969, Ser. No. 866,834
Int. Cl. E21b 43/117
U.S. Cl. 175—4.59 5 Claims



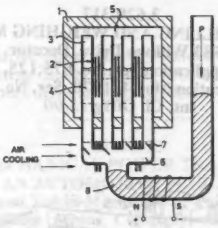
A bullet-perforating gun and a shaped charged perforator are aligned in a common plane within a tool suitable for passage through an earth borehole. One or both of the perforators have their axes, respectively, inclined such that the resulting two perforations intersect before either reaches its normal depth of penetration. The perforators are arranged to fire simultaneously. Because of the time difference in speed of action, the shaped charge perforates first. At a time later, the bullet makes a perforation which breaks into the shaped charge perforation. In escaping through the shaped charge hole, the gases flush out the pulverized material from the bullet perforation, the shaped charge perforation and any enlargement of the common portions of the two holes.

3,620,315

NUCLEAR REACTOR WITH OSCILLATING LIQUID COOLANT MODERATOR

Gilbert Northcott Walton, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 1, 1968, Ser. No. 725,678
Int. Cl. G21c 7/32
U.S. Cl. 176—20 14 Claims



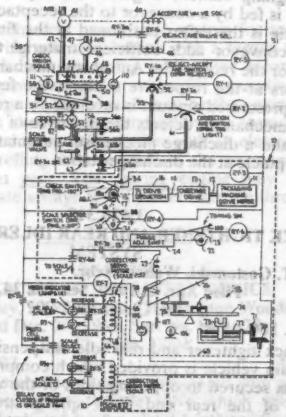
A nuclear reactor having a negative temperature coefficient of reactivity and having coolant moderator means wherein as the temperature of the core decreases below a mean value more cooling effect is applied to the core and as the temperature of the core increases above said mean value less cooling effect is applied to the core, whereby the reactivity of the core undergoes a sustained self-excited oscillation and the temperature also oscillates about said mean value.

3,620,316

HIGH-SPEED CLASSIFICATION AND CHECKWEIGHING SYSTEM

Nelson R. Henry, and Donald R. Middour, both of Decatur, Ga., assignors to The Woodman Company, Inc., Decatur, Ga.

Filed June 22, 1970, Ser. No. 48,339
Int. Cl. G01g 19/52
U.S. Cl. 177—50 21 Claims



A system for monitoring packages and maintaining constant weight is disclosed wherein the checkweighing scale services at least two weighing scales with a scale selector switch responsive to the packaging means and independent of the package being checkweighed. The scale selector

switch operates in synchronism with the scale dump timing switch also responsive to said packaging means to maintain the operations in step and adjustment means is provided to vary the number of bags between the packaging means and the checkweighing scale. A drive circuit includes check switch means responsive to the packaging means and independent of the package to energize companion reject-accept or classification and correction circuits to maintain the actions concurrent; a scale return circuit is provided; and a photoelectric sensing circuit is provided in said correction circuit to disable the same on a dry cycle. Holding relays maintain the companion circuits energized and delay means is provided in the drive circuit for the adjusting means of the scale being standardized to prevent switching of the classification, correction and scale return action during a single packaging cycle.

3,620,317

AUTOMATIC FILLING AND WEIGHING MECHANISM

Nelson R. Henry, 583 Willivee Drive, Decatur, Ga.

Continuation of application Ser. No. 675,125, Oct. 13, 1967. This application May 4, 1970, Ser. No. 33,150

Int. Cl. G01g *13/00*

U.S. Cl. 177—54 **21 Claims**

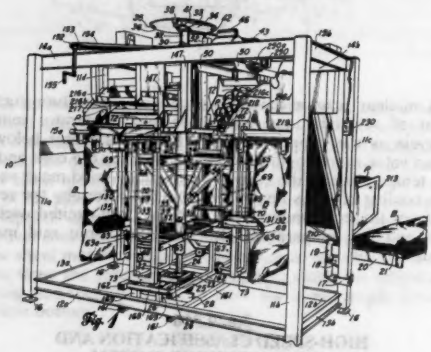


Fig. 1

Automatic filling and weighing mechanism in which successive receptacles are moved in a prescribed path to a bulk-weighing station, then to a final weighing station, and then to a discharge station. When a receptacle is positioned at a bulk-weighing station, a great majority of the weight of material is fed by a conveyor to the receptacle and when the receptacle is thereafter positioned at the final weighing station, a conveyor adds sufficient material to complete the weight for the receptacle. Automatic mechanisms control the conveyors at the respective stations, the feed being altered when a prescribed amount is received by a receptacle. An interlock mechanism detects the presence of a receptacle at a station and a discharge mechanism automatically discharges the receptacle at the discharge station.

3,620,318

TRACK TIGHTENER AND REAR IDLER SUSPENSION SYSTEM

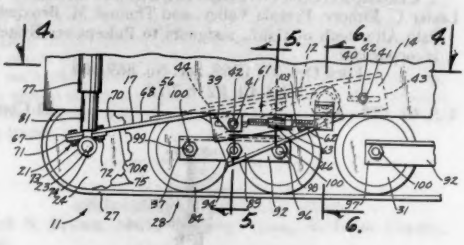
Frank T. Gostomski, Wahoo, Nebr.

Filed Apr. 2, 1970, Ser. No. 24,987

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **11 Claims**

A track tightener and rear idler suspension system for an all terrain vehicle is provided which comprises two elongate brackets secured to opposing sides of the vehicle frame forwardly of the rear end. Leaf springs are secured to the brackets and extend rearwardly to proximate the rear end of the vehicle. The rear idler assembly is secured to the rear ends of the leaf springs. The brackets are movable forwardly and rearwardly to facilitate the adjustment of the track to the proper tension. Because the rear idler assembly is supported by the leaf springs, the idler assembly can be disposed rearwardly of the rear of the vehicle which prevents the vehicle from becoming hung up when crossing ditches and gullies. In addition, as more weight is added to the vehicle, the rear idler assembly is moved upwardly which automatically tightens the track and prevents slippage.



3,620,319

STEERING DRIVE FOR TRACK-LAYING VEHICLES

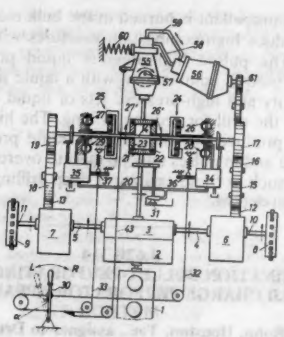
Waldemar Aramasow; Helmut Muller, and Hans Lindenthal, all of Heidenheim, Germany, assignors to Voith Getriebe KG, Heidenheim, Germany

Filed Mar. 16, 1970, Ser. No. 19,702

Claims priority, application Germany, Mar. 14, 1969, July 12, 1969, P 19 13 011.1 P 19 35 592.1

Int. Cl. B62d *11/16*

U.S. Cl. 180—6.44 **1 Claim**



A track-laying vehicle has a track on each side with a track-driving member for each track and with an engine driving the track-driving member through respective differential drives, each of which has a control member rotatable in one direction to speed the track-driving members up and in the other direction to slow the track-driving members down. A control arrangement connects the control members for rotation thereof for steering the vehicle. The control arrangement provides for rotation of the control members in respective opposite directions at controlled speed, while the rate at which the control members are rotated is measured and a signal is produced in conformity therewith which is employed for maintaining the speed of adjustment of said control members substantially constant.

3,620,320

STEERING DRIVE FOR TRACK-LAYING VEHICLES

Waldemar Aramasow, Heidenheim, Germany, assignor to Voith Getriebe KG, Heidenheim (Brenz), Germany

Filed Aug. 4, 1969, Ser. No. 847,195

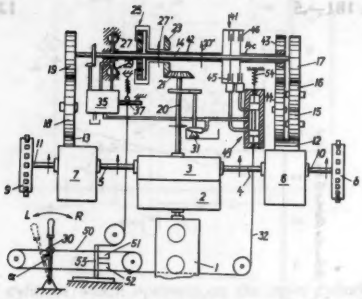
Claims priority, application Germany, Aug. 8, 1968, P 17 80 165.9

Int. Cl. B62d *11/16*

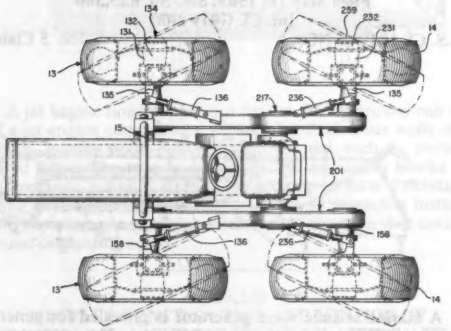
U.S. Cl. 180—6.44 **13 Claims**

The present invention concerns a steering transmission for track-laying vehicles, according to which the driving through a left-hand as well as a right-hand curve can be effected with a single hydrodynamic brake. To this end, the brake rotor is,

by means of a double clutch, selectively connected to one or the other of two shafts interconnected by a reversing transmission. One of these shafts, or both together, form the zero shaft.

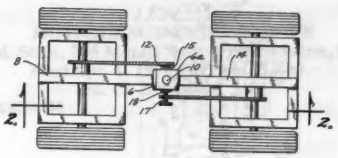


3,620,321
TRACTOR DRIVE CONVERSION
John L. Thibodeau, Tampa, Fla., assignor to Standard Alliance Industries, Inc., Chicago, Ill.
Filed Apr. 1, 1969, Ser. No. 811,728
Int. Cl. B60k *17/30, 17/34*
U.S. Cl. 180—46 **3 Claims**



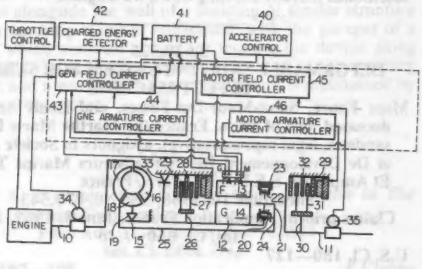
There is disclosed a means to convert a conventional two wheel drive tractor to four wheel drive utilizing the original tractor power unit, the transmission-differential and the frame comprising two walking beam frame assemblies connected to the original rear drive axle, each housing a sprocket for a front wheel, a sprocket for a rear wheel, a means to drive these wheels, and a chain to take the power from the drive means and transfer it to the wheel sprockets. The drive sprocket is connected to the tractor rear axle transmission-differential on each side of the tractor so that the power from the tractor is transmitted to the front and rear wheel sprockets by the continuous chain. A ball joint is added to each wheel which is connected to the wheel sprocket in the frame, a hydraulic cylinder is connected to each ball joint with a steering arm allowing the wheel to be steered hydraulically. A vertical hydraulic cylinder is connected to a yoke which extends over the hood of the tractor allowing the power unit to be raised or lowered hydraulically without affecting the plane of the four wheels of the tractor and acting as an oscillator on the front wheels.

3,620,322
UNIVERSAL DRIVE APPARATUS
Clifford Dean Peterson, 704 W. Olive, Marshalltown, Iowa
Filed Aug. 20, 1969, Ser. No. 851,572
Int. Cl. B60k *17/30*
U.S. Cl. 180—51 **4 Claims**



A universal drive apparatus to connect the frames and the power-transmitting shafts of two sets of driven wheels to make a four wheel drive articulating frame vehicle.

3,620,323
ELECTROMECHANICAL POWER TRAIN SYSTEM FOR AN AUTOMOTIVE VEHICLE
Riichi Maeda, and Yoichi Mori, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan
Filed May 29, 1969, Ser. No. 828,980
Claims priority, application Japan, May 31, 1968, 43/37231
Int. Cl. B60l *11/14*
U.S. Cl. 180—65 A **1 Claim**

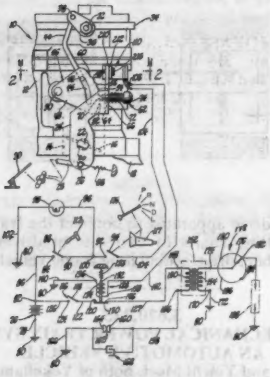


An electromechanical power train system for an automotive vehicle having a driving engine with a torque converter in which an electric-generating and motor means having operation as a generator and/or motor for generating electric energy for storage supply when driven by the engine and for driving a driven shaft when energized by the storage supply, is accommodated therewith together with an electronic controller for controlling the operation of the components with speed reduction gear. The driving engine may be small enough to operate always at full power with the throttle fully open.

3,620,324
STUCK THROTTLE SAFETY DEVICE
Marion L. Smitley, 12703 Nadine, Huntington Woods, Mich.
Filed Dec. 29, 1969, Ser. No. 888,679
Int. Cl. B60k *27/08*
U.S. Cl. 180—103 **14 Claims**

An internal combustion engine, associated with a vehicle, has a carburetor with a throttle valve which upon being opened a predetermined degree closes a related first electrical switch; a second electrical switch is closed in response to the vehicular main power transmission being placed in some mode of power transmission therethrough, a third electrical switch is closed in response to the actuation of the vehicle brake pedal; when the above switches are closed a resulting relay operated switch is energized thereby opening the circuit

leading from a source of electrical potential to the related vehicle ignition system so as to thereby prevent the occurrence of a spark discharge at the engine igniter or spark plug assemblies thereby shutting down the engine.



3,620,325

DEFORMABLE SKIRTING SYSTEM FOR SURFACE EFFECT MACHINE

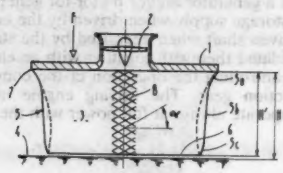
Marc Faure, Saint-Maur-Des-Fosses, and Louis Arsandaux, deceased, late of Paris, France (by Marthe Marie Louis Arsandaux, legal representative), assignors to Societe D-Etudes et De Developpement Des Aeroglisseurs Marins Terrestres Et Amphibies S.E.D.A.M., Paris, France

Filed June 10, 1968, Ser. No. 870,543

Claims priority, application France, June 8, 1967, 109,638

Int. Cl. B60v 1//16

U.S. Cl. 180—127 **8 Claims**



A ground effect machine having a deformable skirt of heterogeneous structure which comprises (i) a flexible reticulated reinforcement structure formed of an interwoven array of wires or cables, and (ii) a flexible fluidtight lining which embeds or is otherwise joined to said reticulated structure and which is formed of a closed continuous surface, said wires or cables being oppositely inclined with respect to meridian lines of said lining surface as well as to parallels thereof.

3,620,326

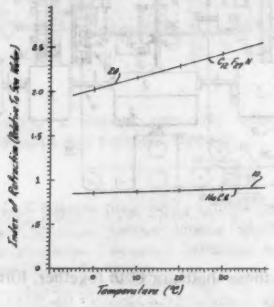
ATHERMAL ACOUSTIC LENS

Ernest A. Hogge, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 20, 1970, Ser. No. 12,982

Int. Cl. G01v 1//16

U.S. Cl. 181—.5 **12 Claims**



This invention is an acoustic refractor that contains a combination of individual fluid lens elements having different indices of acoustic refraction which cooperate to produce a uniform acoustic refraction over a wide range of ambient temperatures.

3,620,327

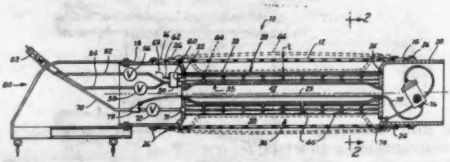
LOW-FREQUENCY GAS EXPLODER

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed May 16, 1969, Ser. No. 825,380

Int. Cl. G01v 1//00

U.S. Cl. 181—.5 NC **5 Claims**



A marine seismic wave generator is provided for generating acoustic impulses into a body of water. The generator includes a housing having an expansible combustion chamber in communication with the surrounding water. A core is provided in the combustion chamber. The combustion chamber periodically receives a charge of combustible fluid. The detonation of the charge causes the chamber to expand and to transmit to the surrounding water relatively high-energy, low-frequency seismic impulses.

3,620,328

CONTROL SYSTEM

Herbert D. Coburn, Dallas, and Gilbert H. Kelly, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

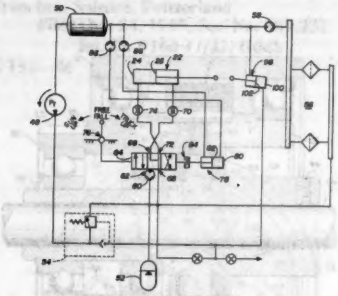
Filed July 3, 1969, Ser. No. 838,982

Int. Cl. G01v 1//04

U.S. Cl. 181—.5 VM **8 Claims**

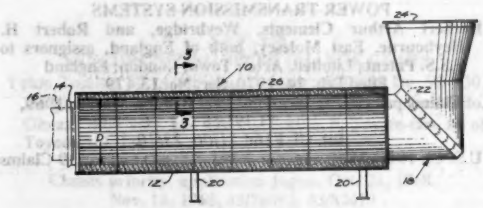
A control system includes a valve that alternately energizes one end of a main hydraulic cylinder to raise a gas gun, energizes the other end of the cylinder to raise a gas gun truck and drains both ends to permit gun or truck free fall. A control cylinder coupled in parallel with the main cylinder

prevents actuation of the valve to raise the gun when the truck is raised, and vice versa. Truck free fall is initiated by a



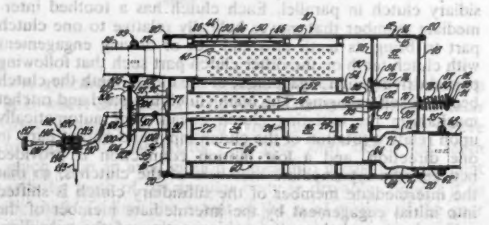
kickoff cylinder which operates on the main cylinder. The rate of both gun and truck free fall is controlled by orifices.

3,620,329
JET ENGINE NOISE SUPPRESSOR
Karl Wenzlaff, Sherman Oaks, Calif., assignor to Glasrock Products, Inc., Atlanta, Ga.
Filed Dec. 31, 1969, Ser. No. 889,593
Int. Cl. B64d *33/06;* **F01n** *1/24*
U.S. Cl. 181—33 HB **4 Claims**



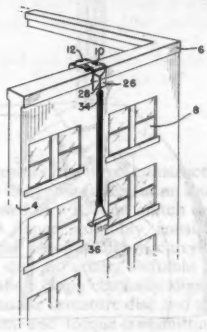
A jet engine noise suppressor for use during ground run up of a jet engine comprising a tube having thick inner walls of a highly porous open cell ceramic material such as porous fused silica. The tube is constructed of numerous blocks of the ceramic material arranged in a circle to form a substantially circular passageway, alternate blocks extending further into the passageway to form recesses in the tube that create sound-dissipating eddys.

3,620,330
MUFFLER CONSTRUCTION AND METHOD OF SELECTIVELY MODIFYING ITS SOUND-ATTENUATING CHARACTERISTICS
James R. Hall, Toledo, Ohio, assignor to Oldberg Manufacturing Company, Grand Haven, Mich.
Filed Apr. 14, 1969, Ser. No. 815,692
Int. Cl. F01n *1/16*
U.S. Cl. 181—65 **18 Claims**



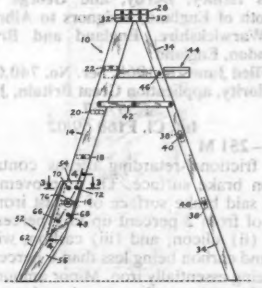
The disclosure embraces a muffler construction and a method of flowing exhaust gases from an internal combustion engine through a muffler construction whereby the gases flow in one path through the muffler through several sound-attenuating components to an outlet in a manner to secure attenuation of sound waves in a broad range of sound frequencies and selectively diverting the incoming gases from an inlet tube directly to the outlet thereby bypassing several sound-attenuating components and reducing sound attenuation providing a noise performance or noise mode.

3,620,331
MOVABLE SUSPENSION DEVICE
Harold M. Shaw, 205 Mozart Ave., Winston-Salem, N.C.
Filed Apr. 6, 1970, Ser. No. 25,840
Int. Cl. E04g *3/08, 3/10*
U.S. Cl. 182—36 **7 Claims**



A horizontally movable suspension device for supporting a workman alongside the wall of a building or similar structure having a securing member engageable with the parapet of a building which contains means for moving the device along the parapet. A supporting device is attached to the securing member, and a workman's support structure is maintained by the supporting means.

3,620,332
SAFETY LADDER
Maurice A. Bourquin, East Granby, Conn., assignor to The M.A.B. Machine Corporation
Filed Aug. 11, 1970, Ser. No. 762,818
Int. Cl. E06c *7/42*
U.S. Cl. 182—108 **8 Claims**



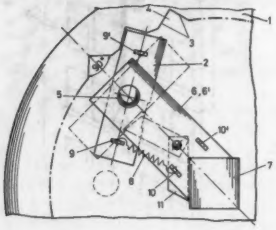
Attachments for the base portions of ladders which serve to laterally widen and forwardly extend the effective base of the ladder to give it stability on uneven or sloping supporting surfaces. Attachments are so designed as to transfer the major portion of the loading on the ladder to the attachments without placing shear stresses on the bolts or other devices securing the attachments to the rails of the ladder. Thus, repetitive use of the ladder will not cause the attaching devices to work loose since loading of such devices under

tension rather than shear does not tend to cause progressive enlargement of the holes in the side rails through which such devices extend. Lower ends of side rails rest upon sloping shelves formed in the attachments while the front edge and one side surface of each rail is confined against rigid walls whereby loading of ladder tends to cause only a rocking of the attachments lengthwise of the attaching devices.

3,620,333
WHEEL-BLOCKING ARRANGEMENT FOR AN EXCAVATING MACHINE

Ernst Menzi, Widnau, Switzerland, assignor to Ernst Menzi AG, Widnau, Switzerland

Filed Sept. 25, 1969, Ser. No. 860,955
Claims priority, application Austria, Oct. 8, 1968, A9836/68
Int. Cl. B60t *1/06*
U.S. Cl. 188—30 **6 Claims**



At least one supporting wheel of a vehicular excavating machine is blocked against rotation in one direction when a spring-loaded pawl pivoted on the machine frame engages a ratchet on the wheel. The pawl is of rectangular shape symmetrical relative to its pivot axis and two of its flat faces engage perpendicular flanks of conforming notches in the ratchet under the pressure of the pawl spring. The spring may be shifted on the pawl to prevent forward or backward rolling of the machine while permitting free rolling movement in the opposite direction.

3,620,334
FRICTIONAL-RETARDING MEANS

Eric Douglas Henley, Derby, and George Eden Walker, Solihull, both of England, assignors to Albright & Wilson Limited, Warwickshire, England and British Railways Board, London, England

Filed June 26, 1968, Ser. No. 740,021
Claims priority, application Great Britain, July 7, 1967, 31,357/67
Int. Cl. F16d *69/02*
U.S. Cl. 188—251 M **9 Claims**

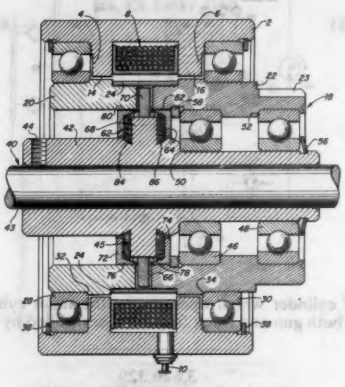
Improved frictional-retarding means containing at least one cast iron brake surface. The improvement consists in constructing said brake surface of a cast iron consisting essentially (i) of from 2 percent up to 5 percent by weight of phosphorus, (ii) silicon, and (iii) carbon, with the total of said silicon and carbon being less than 6 percent, and (iv) the remainder being essentially iron. Minor amounts of the impurities usually found in cast iron may be tolerated.

3,620,335
MAGNETIC PARTICLE COUPLING

James R. Hendershot, and Robert F. Searle, both of Amherst, N.H., assignors to Vibrac Corporation, Chelmsford, Mass.

Filed Feb. 4, 1970, Ser. No. 8,472
Int. Cl. F16d *37/02*
U.S. Cl. 192—21.5 **12 Claims**

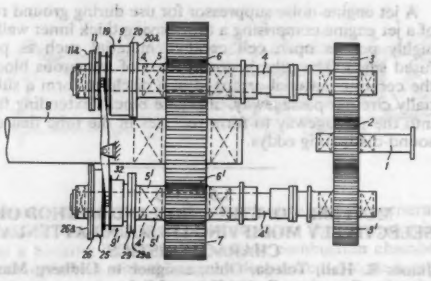
A magnetic particle torque-transmitting device comprising means for providing face-sealing shaft seals such that the magnetic particles are substantially prevented from escaping from between the seals and the shaft.



3,620,336
POWER TRANSMISSION SYSTEMS

Herbert Arthur Clements, Weybridge, and Robert H. Heybourne, East Molesey, both of England, assignors to S.S.S. Patents Limited, Acton Town, London, England

Filed Feb. 24, 1970, Ser. No. 13,479
Claims priority, application Great Britain, Mar. 3, 1969, 11,191/68
Int. Cl. F16d *21/00, 23/10*
U.S. Cl. 192—35 **9 Claims**



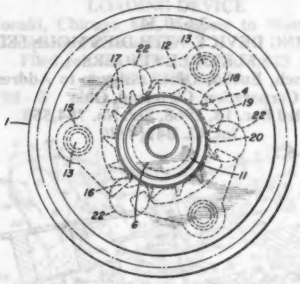
A power transmission system with a main clutch and a subsidiary clutch in parallel. Each clutch has a toothed intermediate member that moves helically relative to one clutch part to bring its teeth into and out of driving engagement with clutch teeth on the other clutch part such that following partial driving interengagement of the clutch teeth the clutch becomes self-engaging. The main clutch has pawl and ratchet mechanism for initiating clutch engagement automatically upon relative rotation of the clutch input and output parts in one direction, and a lost motion connection is provided between the intermediate members of the clutches, so that the intermediate member of the subsidiary clutch is shifted into initial engagement by the intermediate member of the main clutch and the self-engaging action of the subsidiary clutch then relieves the intermediate member of the first clutch of load.

3,620,337

UNIDIRECTIONAL ROTARY DRIVE COUPLING DEVICE FOR A WATCH MOVEMENT

Josef Fluck, Grenchen, Switzerland, assignor to A Schild S. A., Grenchen, Soleure, Switzerland

Filed Oct. 24, 1969, Ser. No. 869,232
Int. Cl. F16d 41/12; G04b
U.S. Cl. 192—46 7 Claims



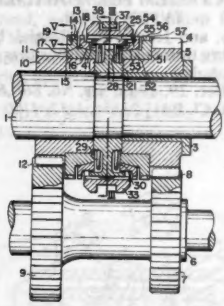
A unidirectional rotary drive coupling device for a watch movement, comprising a ratchet mechanism positioned in the axial space between two coaxially arranged wheels.

3,620,338

SYNCHRONIZING SPEED CHANGE GEARS

Yukio Tomita, 70, Asahi-cho, 2-chome; Shinichi Ito, 90-930, Ichigi-cho Yanda; Yositaka Sogo, 10-1, Aza-Soskindo, Ohaza Ohbayashi, and Hideki Morino, 8, Toyota-cho, all of Toyoda-shi, Japan

Filed Oct. 17, 1969, Ser. No. 867,214
Claims priority, application Japan, Oct. 21, 1968, Nov. 11, 1968, 43/76092; 43/82410
Int. Cl. F16d 23/10, 13/60
U.S. Cl. 192—53 F 8 Claims



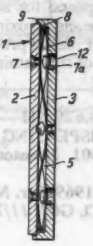
A synchronizing speed change gear comprises a shaft, a gear wheel arranged loosely on the shaft, a toothed annular body arranged on the gear wheel and a gear shift sleeve rotatable with the shafts. The gear shift sleeve has teeth which upon an axial motion comes into meshed engagement with the teeth of the annular body to drivably connect it to the shaft. To limit the extent of the axial motion of the gear shift sleeve stops are provided by projections or shoulders formed on the sides of the teeth of the annular body or of the gear shift sleeve.

3,620,339

ELECTROMAGNET CLUTCH OR BRAKE, TWISTED TORSION SPRING THEREFOR

Hermann Becking, Haferwey 26, Hamburg-Altona, Germany

Filed Aug. 18, 1969, Ser. No. 850,930
Claims priority, application Germany, Mar. 25, 1969, P 19 15 162.3
Int. Cl. F16d 27/06, 27/10
U.S. Cl. 192—84 A 16 Claims



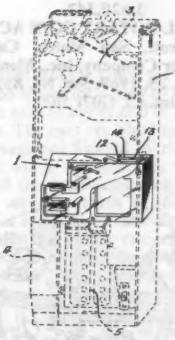
This invention resides in a novel construction of an annular armature-reaction flange assembly for an annular rotary electromagnet to be used as a friction clutch or as a brake. The armature-reaction flange assembly consists of an axially nonshiftable annular reaction flange carrying on its hub an annular armature disc in axially shiftable but nonrotatable manner both members being coaxially aligned with the electromagnet. Between the armature disc and the backing flange a torsion retraction and torque-transmitting spring is provided consisting of an annular planar disc secured alternately at angularly evenly spaced points to the armature disc and to the reaction flange. This planar disc is twisted in alternately opposite directions out of its radial plane in such a manner that the zones of greatest twist are disposed at its securing points. This annular torsion spring may also be subdivided into ring-sectors.

3,620,340

MONEY-HANDLING DEVICE

Merrill M. Jenkins, 11591 Josyln Ct., St. Louis, Mo.

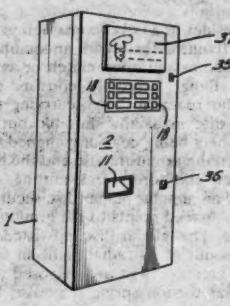
Filed July 9, 1969, Ser. No. 840,145
Int. Cl. G07f 5/10
U.S. Cl. 194—9 23 Claims



In a money-handling device, used in accepting, crediting, and preparing for escrowing and/or refunding money, coins, or the like, and for use in conjunction with, or as a component replacement, in coin accumulators and change dispensers presently used in conjunction with the standard vending machines that display and automatically merchandise foods, goods, or other items; the device is compactly constructed and arranged for cooperating with the standard money-validating mechanisms presently in use and into

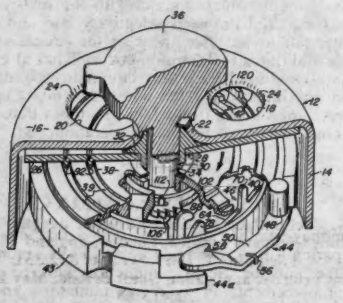
which coins are initially introduced when deposited into the vendor, with the present device furnishing the remaining interactive components that function to continue coin segregation, temporarily escrow the same, inherently provide for its crediting and/or debiting, and pay out any excess funds after a selection of one or more items has been made upon the accompanying vending machine, then discharging said temporarily escrowed funds into a cashbox, tube, or other storage location. This money-handling device provides coin chutes arranged to receive select coins, and switch or sensor means are operatively disposed for sensing the presence of the coins, while stop means proximate each chute and cooperative with the sensor means provides for temporary retarding and then releasing of the detained coins.

3,620,341
HOT FOOD DISPENSING MACHINE
John D. L. Gardner, 401 Houston First Saving Bldg., Houston, Tex.
Filed July 30, 1969, Ser. No. 845,962
Int. Cl. G07f 11/72
U.S. Cl. 194—10 **1 Claim**



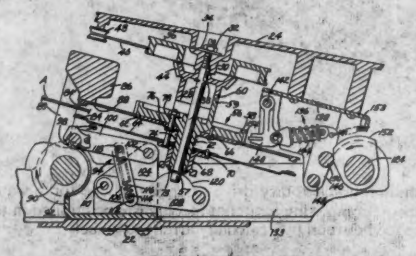
A dispensing machine for maintaining food in cold storage, and, in response to coin deposits, a selection from a variety of foods may be accomplished, and the food so selected automatically delivered into a microwave cooking unit and quickly cooked, and delivered to a delivery tray where it may be received by the buyer.

3,620,342
MECHANICAL ROTARY COIN ACCEPTOR
Bernard Clark Prescott, San Mateo, Calif., assignor to Universal Coin Meter Company, Inc., Menlo Park, Calif.
Filed Aug. 25, 1969, Ser. No. 852,704
Int. Cl. G07f 5/00
U.S. Cl. 194—61 **17 Claims**



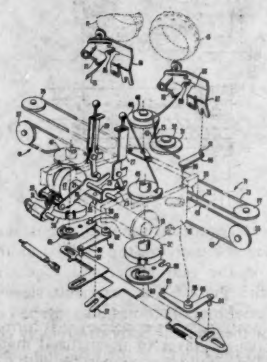
A coin-metering apparatus having mechanisms for sensing the thickness and diameter of coins and a transport structure for serially moving plural coins past such sensing mechanisms. The coin-transporting structure is arranged to move the coins in a circular path thereby rendering the device more compact. A housing for such coin-metering apparatus that includes an improved shaft bearing mounting configuration. A coin-metering apparatus that includes provisions for forcefully ejecting coins therefrom into a coin receptacle. A coin-thickness-sensing mechanism that is capable of accurately sensing the thicknesses of different coins. A coin transport system that enables the user thereof easily to remove coins that are not accepted by the apparatus.

3,620,343
EMBOSSING DEVICE WITH DIES MOUNTED ON FLEXIBLE FINGERS
Fritz A. Deutsch, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Dec. 18, 1968, Ser. No. 784,558
Int. Cl. B41j 1/30
U.S. Cl. 197—6.7 **7 Claims**



An embossing device which utilizes a pair of spaced discs. The discs have fingers. At the ends of the fingers of one disc are punch members and at the ends of the fingers of the other disc are corresponding die members. An actuation mechanism is provided which first moves one disc toward the other to close the fingers against the article to be embossed and then after closure generates embossing force against an anvil. The anvil is mounted on a first reaction bar to contain the reaction forces of embossing therebetween; and a second reaction bar is connected to the first reaction bar to contain the drive reaction forces therebetween. Also an interposer is provided for precise positioning of the punches and dies.

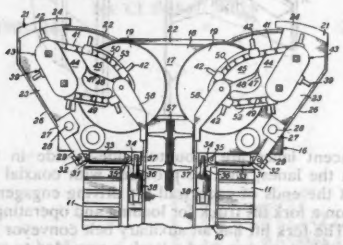
3,620,344
SELECTION SYSTEM FOR A DUAL-ELEMENT TYPEWRITER
Douglas E. Clancy, and Jerome B. O'Daniel, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 29, 1969, Ser. No. 888,689
Int. Cl. B41j 23/04, 1/32, 1/60
U.S. Cl. 197—18 **4 Claims**



A dual-element typewriter mounts the print elements a fixed distance apart with a carrier support system and

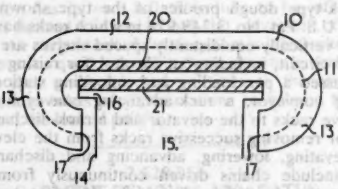
operates each element from a single keyboard and selection system. A control is positionable to select the desired element. Each element is connected to opposite ends of a flexible strand and pulley system for rotating and tilting the elements to position the selected character at the print point. The control operates to prevent the rotation and tilting of one element so that the strand and pulley system moves only the element carrying the selected character to bring that character to the print point.

3,620,345
LOADING DEVICE
Joseph Gonski, Chicago, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.
Filed Jan. 29, 1970, Ser. No. 6,823
Int. Cl. B65g *65/06*
U.S. Cl. 198—8 **5 Claims**



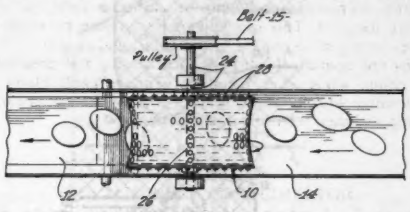
A loading head for a mining machine having an inclined apron slidable along the ground and crowded into loose material on the mine floor. A pair of counterrotating gathering discs, mounted on the apron, move loose material on the discs to a carry-away conveyor. A pair of adjustable wing extensions, with sidewalls thereon, are mounted at each side of the apron to vary the width of the apron's loading surface and to retain loose material on the loading surface. A gathering sweep, associated with each wing extension, moves loose material from areas on the loading head beyond the reach of the gathering discs, onto the discs for loading onto the carry-away conveyor.

3,620,346
CONVEYORS
Thomas A. Brooke, Prescott and William C. Neller, Frodsham, both of England, assignors to Dunlap Holdings Limited, Birmingham, England
Filed Dec. 3, 1969, Ser. No. 881,773
Claims priority, application Great Britain, Dec. 7, 1968, 58,246/68
Int. Cl. B66b *9/12*; **B65g** *15/30*
U.S. Cl. 198—16 **4 Claims**



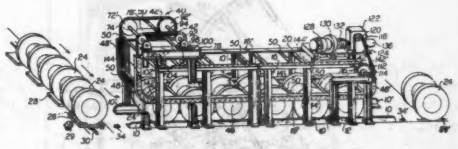
The handrail for a passenger conveyor is formed of a flexible material having a layer of magnetized material on one surface. The magnetized layer cooperates with a support having means for providing a magnetic field, such as a further layer of magnetized material, which field repels the handrail, of which the following is a specification.

3,620,347
EGG-HANDLING EQUIPMENT
Roy Bruce Wyland, Arcadia, Calif., assignor to J. W. Wyland & Sons, Inc., Rosemead, Calif.
Filed Sept. 17, 1969, Ser. No. 858,621
Int. Cl. B65g *19/22*
U.S. Cl. 198—25 **1 Claim**



Egg-handling equipment is provided which includes an improved rotatable drum assembly having an apertured soft resilient peripheral surface, which enables eggs to be controlled and moved without breakage and in spaced relationship from place to place and from one elevation to another.

3,620,348
MAGAZINE FEED STORAGE CONVEYOR
William Kursinczky, Woodbridge, N.J., assignor to General Cable Corporation, New York, N.Y.
Filed Oct. 24, 1969, Ser. No. 869,077
Int. Cl. B65g *19/02*
U.S. Cl. 198—75 **13 Claims**

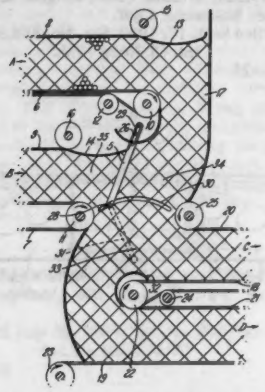


This magazine feed storage conveyor is for reels of electric cable which are too heavy for a man to lift. Reels of cable are brought by shuttle cars to either end of a long frame which is open at both ends. The cars are tilted to roll the reels off and into the storage magazine formed by the frame. A conveyor belt has elements which contact with the reels above their center axes to roll the reels selectively into and out of the magazine and to advance them in the magazine to make room for additional reels. Automatic switches at each end of the frame condition the motor circuit to operate the conveyor in one direction or the other, depending upon which end a reel approaches from. Limit switches determine how far the conveyor moves with each operation.

3,620,349
ARTICLE-HANDLING APPARATUS
Alan K. McCombie, London, England, assignor to Molins Machine Company Limited, London, England
Filed May 7, 1969, Ser. No. 822,351
Claims priority, application Great Britain, May 10, 1968, 22,413/68
Int. Cl. B65g *57/16*, *57/32*
U.S. Cl. 198—78 **11 Claims**

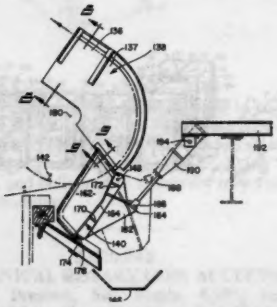
This invention is concerned with merging two stacks of cigarettes or other rodlike articles by carrying the stacks continuously into a merger zone from which a merged stack or a

divided merged stack is delivered. The preferred arrangement includes flow sensors in both input channels to control



the feed rates, and a flap to control automatically the relative rates of feed of the two stacks into the merger zone.

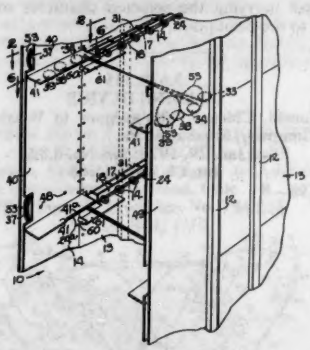
3,620,350
BULK MATERIAL FLOW CONTROL APPARATUS
Edward E. Cheek, Cleveland Heights, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio
Filed Dec. 11, 1969, Ser. No. 884,172
Int. Cl. B65g *15/60*
U.S. Cl. 198—102 **5 Claims**



There is provided a flow control apparatus for use in conjunction with bulk material stacking and reclaiming apparatus. These devices are installed on the proximal extremity of a stacker-reclaimer boom and include a shroud extending at least partly around the tail sprocket, an opening for the discharge of bulk material as on reclaiming, and a gate or door for selectively closing and opening the material discharge opening.

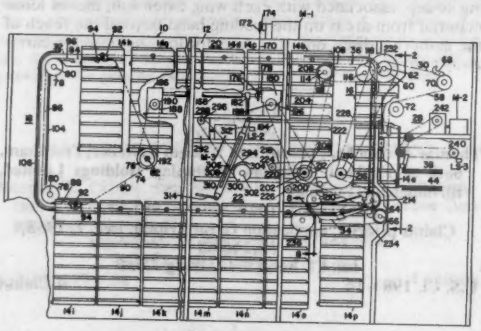
3,620,351
CONVEYING AND STORAGE APPARATUS
Wallace H. Jerome, 34 N. Seventh St., Barron, Wis., and Melvin J. Jensen, Barron, Wis., assignor to said Jerome by said Jensen
Division of Ser. No. 688,612, Dec. 6, 1967, Pat. No. 3,565,267
Filed Nov. 23, 1970, Ser. No. 91,616
Int. Cl. B65g *15/00;* **H01r** *39/52*
U.S. Cl. 198—129 **5 Claims**

An article storage apparatus having one or more elongated lanes defined between rows of vertical posts with pairs of horizontal side rails vertically spaced in each lane and fastened to the posts. On each rail is a row of load rollers having central peripheral grooves receiving the active runs of a cable conveyor comprising an endless cable trained around supporting pulleys located at both ends of each rail. The pulleys are disposed outside the rails, and guide wheels in out-of-the-way positions lead the cable outwardly onto the pulleys, back inwardly into the lane, and, at one end, cause the cable to crossover so that one endless cable forms both active runs for positive correlation of movement. The pulleys



for adjacent lanes are mounted side-by-side in the walls between the lanes, and are provided with coaxial gears exposed at the ends of each wall for driving engagement with pinions on a fork lift truck for loading and operating the conveyors. The fork lift has an auxiliary belt conveyor for assisting the cable conveyor, and a latch is provided to anchor the truck in place.

3,620,352
RACK-TYPE DOUGH PROOFER
William H. Gilgore, and Carey L. Shirey, both of York, Pa., assignors to Teledyne, Inc., York, Pa.
Filed Aug. 27, 1970, Ser. No. 067,384
Int. Cl. B65g *17/16*
U.S. Cl. 198—138 **14 Claims**



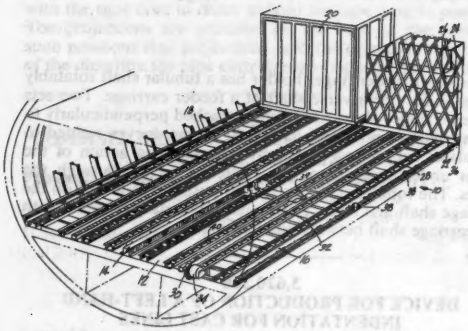
A rack-type dough proofer of the type shown in D. F. Howard U.S. Pat. No. 3,349,928 in which racks having a plurality of vertically equidistantly spaced shelves are moved in a closed circuit, including an elevator for raising successive racks passed a pan loading and unloading station, a rack-lowering conveyor, a rack-advancing conveyor delivering successive racks to the elevator and a rack-discharging conveyor for removing successive racks from the elevator. The rack elevating, lowering, advancing and discharging conveyors include chains driven continuously from a single motor in timed relation. The rack-advancing conveyor includes rack-engaging elements connected to the continuously operating rack-advancing conveyor chains for moving successive racks into position to be engaged by rack-engaging elements connected to the continuously operating elevator conveyor chains, the rack-engaging elements of the rack advance conveyor chains being arranged to hold the racks stationary in such position for a sufficient length of time to be picked up by a rack-engaging element of the elevator conveyor chain. The rack advance conveyor slopes upwardly

from a point at which a rack-engaging element of the rack advance conveyor chain engages a rack at an angle such that as a rack moves along such slope it travels through a horizontal distance to bring it in vertical alignment with a preceding rack being elevated by the elevating conveyor in the same time that it travels a vertical distance equal to a rack shelf space, or preferably a somewhat greater distance than a rack shelf, so that the rack arrives in position to be picked up by the elevating conveyor somewhat prior to the arrival of the rack-engaging element of the rack-elevating conveyor chain, to provide a certain amount of tolerance.

3,620,353
CHAIN-DRIVE CARGO-HANDLING SYSTEM

Milton E. Foster, Palos Verdes Estates, and Dimitri A. Gogin, Torrance, both of Calif., assignors to McDonnell Douglas Corporation

Filed Dec. 22, 1969, Ser. No. 887,160
Int. Cl. B65g *15/00*
U.S. Cl. 198—160 **2 Claims**



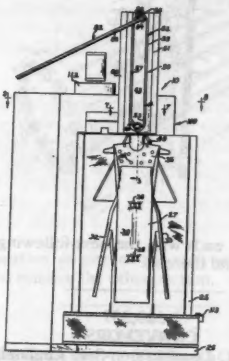
A chain-drive cargo-handling system within the cargo deck of an aircraft in the form of a conveyor mechanism involving an endless chain assembly continuously operated by a suitable motor. The chain comprises a plurality of interconnected rollers with support pads which are raised by inflatable tubes positioned thereunder to cause uniform frictional pressure contact to the bottom surface of cargo pallets to be moved on support rollers from station to station on the cargo deck. The frictional engagement of the support pads with a cargo container moves it to the next station on support rollers. Each station has its own inflatable tube to be inflated and deflated as desired to move or halt the movement of the pallets along the cargo deck. A latch system is interlocked to the drive system for quickly locking down the containers for pallets when they reach selected positions on the cargo deck and to deflate tubes at those stations to release the drive system from the locked pallets.

3,620,354
GARMENT REMOVAL APPARATUS

Jerry N. McMillan, P.O. Box 167, Colville, Wash.

Filed Apr. 27, 1970, Ser. No. 32,306
Int. Cl. B65g *17/20*
U.S. Cl. 198—177 **14 Claims**

A garment removal apparatus is described for removing garments from garment forms with the garment hung on hangers and then conveying the garment from the form. The removal apparatus includes a hanger-supporting means formed in the neck and shoulder section of the garment form to receive hangers. After a hanger is mounted in the hanger support means, the garment is mounted on the form about

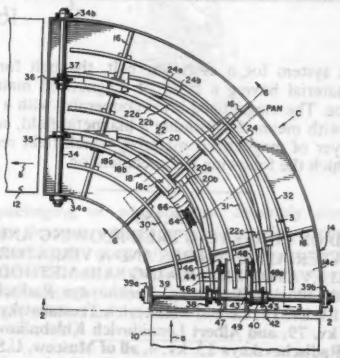


the hanger. A hanger-lifting means is operated to engage and lift the hanger and garment from the form.

3,620,355
CORNER CONVEYOR

Morris C. Jones, Jr., and Gary Eugene La Pan, both of Saginaw, Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Oct. 28, 1969, Ser. No. 871,869
Int. Cl. B65g *15/02*
U.S. Cl. 198—182 **7 Claims**



A corner conveyor for transferring articles between two endless conveyors, which generally extend at right angles to each other. The conveyor includes a pair of endless chains journaled around sprockets mounted on a pair of shafts which generally extend at right angles to each other. Upper and lower, nonparallel, curvilinear, guides are provided for guiding the upper and lower runs respectively, of each endless chain. The curvature of the lower guide is greater than that of the upper guide.

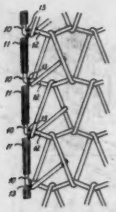
3,620,356
WIRE MESH CONVEYOR BELT

Jannes Jonge Poerink, 25 Brins Bernhardlaan, Borne, Netherlands

Filed July 24, 1969, Ser. No. 844,385
Claims priority, application Germany, July 26, 1968, P 17 56 882
Int. Cl. B65g *15/30*
U.S. Cl. 198—193 **2 Claims**

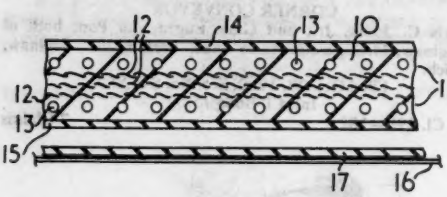
A wire mesh conveyor belt of the type described, made of crossbars, with wire spirals connecting them, characterized

by the feature that the ends (10) of said crossbars are bent over and provided with cylindrical edge members which con-



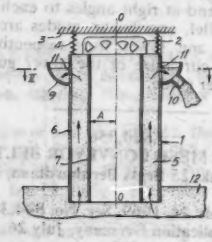
nect said bent over ends with the next-following crossbar in the region of the bend thereon.

3,620,357
CONVEYORS
Hugh L. Folkes, St. Leonard's-on-Sea, England, assignor to Dunlop Holdings Limited, London, England
Filed Nov. 24, 1969, Ser. No. 879,364
Claims priority, application Great Britain, Dec. 6, 1968, 57,936/68
Int. Cl. B65g *15/30*
U.S. Cl. 198—193 **4 Claims**



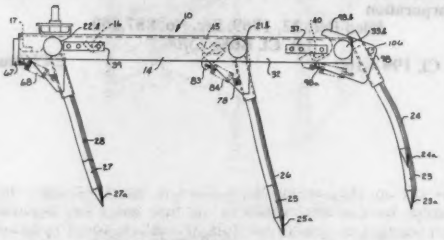
Support system for a conveyor belt, the belt formed of flexible material having a layer of magnetized material on one surface. The magnetized layer cooperates with a support provided with means for forming a magnetic field, such as a further layer of magnetized material, which field repels the belt, of which the following is a specification.

3,620,358
METHOD OF CONVEYING FREE-FLOWING AND LUMP MATERIALS UPWARDS AND A VIBRATORY ELEVATOR EMBODYING SAID METHOD
Rafail Mikhailovich Brumberg, Verkhnyaya Radischevskaya ulitsa, 13, kv. 15; Leonid Moiseevich Trostanetsky, Petrovka 26, kv. 79, and Albert Leonidovich Khlebnikov, Verkhnyaya Radischevskaya 13, kv. 4, all of Moscow, U.S.S.R.
Filed June 11, 1969, Ser. No. 832,211
Claims priority, application U.S.S.R., June 12, 1968, 1,246,608
Int. Cl. B65g *27/04*
U.S. Cl. 198—220 BA **8 Claims**



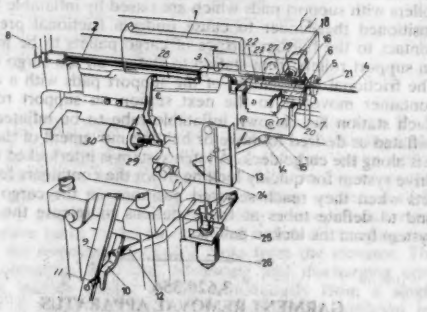
The present invention relates to methods of conveying free-flowing and lump materials and to vibratory elevators embodying the methods. The method consists in imparting a torsional oscillatory motion to a working element about its axis and a rectilinear oscillatory motion along the axis, the latter motion having a frequency twice that of the former. The working element has a number of rectilinear channels arranged parallel to and a distance away from its axis.

3,620,359
BALER FEEDER FINGER HOLDER
Charles A. Smith, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Sept. 24, 1969, Ser. No. 862,155
Int. Cl. B65g *25/08*
U.S. Cl. 198—223 **13 Claims**



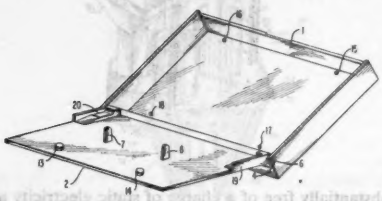
The baler feeder finger holder has a tubular shaft rotatably mounted on a transverse shaft of a feeder carriage. Two sets of feeder finger plates are fixedly attached perpendicularly to the tubular member and have split finger sleeves welded to the plates supporting fingers by the clamping action of the plates under pressure of the fastening means through the plates. The tubular shaft has spaced bushings mounted on the carriage shaft and forms an annular lubricating chamber with the carriage shaft between the bushings.

3,620,360
DEVICE FOR PRODUCTION OF A LEFT-HAND INDENTATION FOR CAST LINES
Karl Debus, Bad Homburg, Germany, assignor to Linotype G.m.b.H., Frankfurt am Main, Germany
Filed Apr. 26, 1968, Ser. No. 724,371
Claims priority, application Germany, May 24, 1967, L56573
Int. Cl. B41b *11/50*
U.S. Cl. 199—50 **6 Claims**



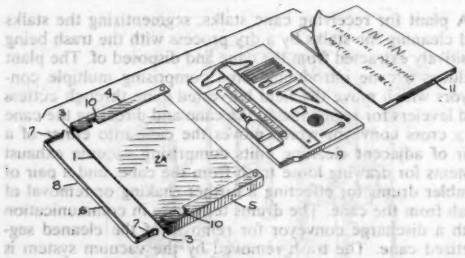
In a linecasting machine, left-hand margin indentation of a line is achieved by the provision of a stop member which is selectably interposed in the path of the left-hand vise jaw which is then moved into abutting relationship with the stop member. For different length indentations, different length stop members are used.

3,620,361
CASING FOR A TAPE CARTRIDGE
Hirotomo Fugiwara; Takuya Arai, and Noboru Miyamoto, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 8, 1969, Ser. No. 864,713
Claims priority, application Japan, Oct. 11, 1968, 43/88684
Int. Cl. B65d *43/16, 85/67*
U.S. Cl. 206—1 R 1 Claim



A rectangular casing for holding a tape cartridge has a hinged cover which in turn has projections for engagement with the tape core in order to hold the tape core in position. The projections are provided on the back of the cover at such positions that projections hold the tape core regardless of the direction the tape cartridge may be put in the casing.

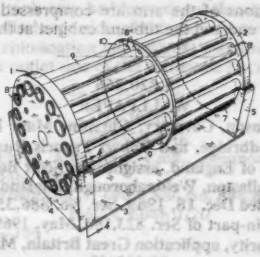
3,620,362
COMBINED DRAWING BOARD AND CONTAINER FOR ARTISTIC MATERIALS
Frederick J. Valdes, 307 East 44 St., New York, N.Y.
Filed June 29, 1970, Ser. No. 50,376
Int. Cl. B44d *3/00*
U.S. Cl. 206—1.7 3 Claims



A combined drawing board and container for artistic materials which may alternatively be used as a briefcaselike container for the artistic materials or as a drawing board for them.

3,620,363
STORAGE AND DISPLAY DEVICE
William C. Donnithorne, Sault Sainte Marie, Ontario, Canada, assignor to The Algoma Steel Corporation, Limited, Sault Sainte Marie, Ontario, Canada
Filed Sept. 8, 1969, Ser. No. 856,085
Claims priority, application Canada, May 30, 1969, 053,072
Int. Cl. B65d *5/50;* A47f *5/02*
U.S. Cl. 206—45.15 16 Claims

A display and storage device particularly suitable for holding uniformly shaped and sized articles. The device consists of two wheels mounted on a common horizontal axis and provided with split storage tubes which can slide in holes in each of the two wheels. A third wheel or disc is placed on the same axis intermediate the two end wheels to hold the tubes

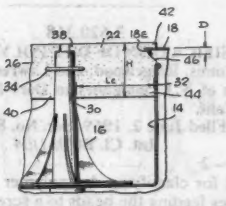


in proper location as one of the split sections of a storage tube is moved relative the other section.

3,620,364
WHEELBARROW PARTS PACKAGING
William C. Lynch, Harrisburg, Pa., assignor to Jackson Manufacturing Co., Harrisburg, Pa.
Filed Mar. 16, 1970, Ser. No. 20,078
Int. Cl. B65d *85/68, 85/64*
U.S. Cl. 207—46 H 5 Claims

The packaging of wheelbarrow assembly components, other than the tray, with a frame in partially assembled condition, whereby the assembly components are compactly arranged and attached to the frame at a location so that they do not substantially increase the stowage area required by the partially assembled frame.

3,620,365
WASHING MACHINE PACKING BRACE
Maurice W. Elwell, 5335 Weseburn Ave., Hawthorne, Calif.
Filed June 5, 1969, Ser. No. 830,773
Int. Cl. B65d *81/06, 85/00*
U.S. Cl. 206—46 M 9 Claims



Apparatus for use in packing a household automatic washing machine for shipment, to brace the agitator and tub against the cabinet of the machine. The apparatus includes

several thick arms of elastic foam material with inner ends joined by an elastic cord so that the arms radiate outwardly. Each arm has a ledge at the top of its inner and outer ends for resting on the agitator and housing, respectively, while the lower portions of the arm are compressed between the agitator at one end and the tub and cabinet at the other end.

3,620,366
WALLPAPER

Norman Parkinson, Coventry; Christine Mary Blakely, Easton, nr. Woodbridge, and Robert Francis Russell, Wellingborough, all of England, assignors to Scott Bader Company Limited, Wallaston, Wellingborough, England

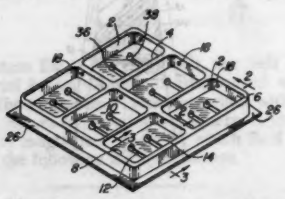
Filed Dec. 18, 1969, Ser. No. 886,350
Continuation-in-part of Ser. 823,180, May, 1969, abandoned
Claims priority, application Great Britain, May 9, 1968, 22,119/68
Int. Cl. C09j *7/04*
U.S. Cl. 206—59 C **7 Claims**

This invention provides a wallpaper having a decorative surface and coated on the back surface thereof with a coating of a permanently tacky pressure sensitive adhesive, the decorative surface being coated with a protective coating of a synthetic resin. The pressure-sensitive adhesive coating and the synthetic resin are so chosen that the protective coating of the synthetic resin on the decorative surface acts as a release coat for the adhesive.

3,620,367
CASSETTE STORAGE CONTAINER

Oren G. Stembel, 3132 N. Nathchez, Chicago, Ill.

Continuation-in-part of application Ser. No. 737,109, June 14, 1968, now abandoned. This application Dec. 30, 1969, Ser. No. 889,044
Int. Cl. B65d *1/34, 85/67*
U.S. Cl. 206—65 R **12 Claims**



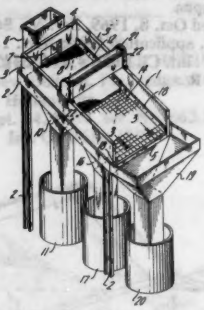
A cassette storage container having short protruding opposed detents extending interiorly in the container for cooperative engagement with opposed outwardly extending elongated protrusions or flanges on cassette end walls to lock the cassette in the container to prevent accidental displacement thereof. Also, the distance between the side and end walls of the container may be slightly smaller than the area between the side and end walls of the cassette whereby the cassette may be held frictionally therein. A fulcrum is provided in the bottom wall of the container on which the cassette seats and about which the cassette is moved when pressure is applied to the top end surface of the cassette, or such fulcra may be positioned integrally on the bottom wall of the cassette to obtain the same action.

3,620,368
CLASSIFICATION OF DRY POLYMER BEADS

William P. Comis, Ridgewood, and Lawrence E. White, Waldwick, both of N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed June 2, 1969, Ser. No. 829,520
Int. Cl. B07b *1/04*
U.S. Cl. 209—2 **7 Claims**

A method for classifying dry polymer beads according to size comprises feeding the beads to a screening zone which is equipped with at least one screen having its surface composed of a material such as poly (tetrafluorethylene) which has a dielectric constant similar to that of the polymer and having openings of the desired size, passing the beads across the surface of the screen and passing a portion of the beads through the openings. As a result of this method, the beads

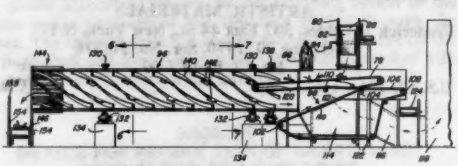


are substantially free of a charge of static electricity and the portion passes through the openings in the screen without significantly blinding the openings.

3,620,369
SUGAR CANE DRY-CLEANING PLANT

Albert C. Steen, and John W. Steen, both of Abbeville, La., assignors to J & L Engineering Company, Inc.

Filed Jan. 15, 1969, Ser. No. 791,243
Int. Cl. B07b *9/00*
U.S. Cl. 209—3 **9 Claims**



A plant for receiving cane stalks, segmentizing the stalks and cleaning the stalks by a dry process with the trash being positively extracted from the cane and disposed of. The plant includes a cane introducing area comprising multiple conveyors which move the field harvested cane through cutters and levelers for segmentizing the cane and directing the cane to a cross conveyor which moves the cane into either of a pair of adjacent cleaning units comprising vacuum exhaust systems for drawing loose trash from the cane, and a pair of tumbler drums for effecting a further shaking or removal of trash from the cane. The drums terminate in communication with a discharge conveyor for removal of the cleaned segmetized cane. The trash removed by the vacuum system is conveyed to a burner for disposal thereof.

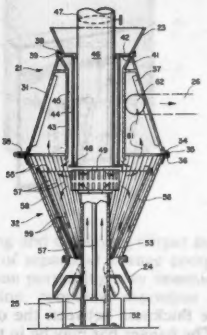
3,620,370
ORE CONCENTRATOR

Rue E. Swayze, P.O. Box 902, Rosamond, Calif.

Filed June 2, 1969, Ser. No. 829,663
Int. Cl. B04c *3/00*
U.S. Cl. 209—144 **5 Claims**

Concentrators for metallic ores, particularly precious metal ores, using centrifuging cyclonic air action without water for primary separation of the heavy metal particles and ore from dust, dirt and lighter particulate. The relatively coarse ores and particulate are collected by gravity drop at the bottom of a centrifuge, while the fines and dust are withdrawn from adjacent the top thereof and fed through a further separating apparatus which blows out the dust and then passes the remaining particulate over dry riffle boards to collect the heavy particles. The cyclonic centrifuge is in the form of an upper, frustoconical, internally baffled or corru-

gated construction with a lower, inverted, frustoconical section likewise internally baffled or corrugated, the sections joining at their largest diameters. Pulverized ore particulate which is to be further concentrated is introduced through the upper frustoconical section. Air is drawn into the device from the top and bottom through a generally centrally located fan and then exited tangentially from the upper section, or, in another embodiment, the air is entered tangentially, with or without the fines therein, and exits the cyclonic separator from the top and bottom. A particulate collector ring may be mounted at the junction between the upper and lower centrifuge sections. The further separator comprises a velocity reducer and agitator and a dispensing box through which the fines pass with removal of the dust and with the dropping of the particulate onto the dry riffle boards.

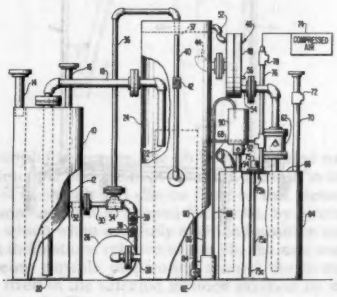


3,620,371

AEROBIC WASTE TREATMENT SYSTEM WITH AUTOMATIC BACK FLUSHING FILTER

Joe M. Valdespino, Orlando, Fla., assignor to Aquanox, Inc., Ft. Lee, N.J.

Filed Dec. 1, 1969, Ser. No. 881,045
Int. Cl. B01d *29/38*
U.S. Cl. 210—117 **9 Claims**



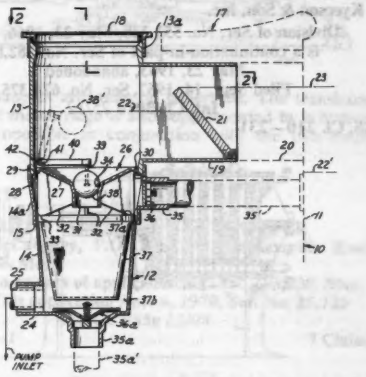
An aerobic waste material treatment system includes a hydraulic comminutor-reaction tank and a vacuum aeration tank connected by a siphon so that comminuted solids in liquid are siphoned into the vacuum tank. A recirculating pump and fluid connection are positioned between the vacuum tank and hydraulic comminutor to recirculate the mixed liquor from the vacuum tank and reaerate it by an aspirator in the recirculating line while, at the same time, discharging tangentially into the comminutor to aid in centrifugal movement for comminuting purposes. A venturi in the recirculating pump discharge line aspirates from the vacuum tank to draw the vacuum within the vacuum tank. The air for anchor in the vacuum tank is admitted from atmosphere under control of a regulating valve. An automatic back flushing filter is connected to the effluent outlet of the vacuum tank. The filter is periodically back flushed by pulsing air from the outlet side of the filter to flush accumulated material on the filter screen back into the vacuum tank. The vacuum tank may be blown down through a blow down valve in the discharge side of the recirculating pump. Automatic batch chlorination and effluent ejection units are connected to the outlet side of the automatic back flushing filter.

3,620,372

SKIM TANK

Gordon F. Ehret, Alhambra, Calif., assignor to Swimquip, Inc., El Monte, Calif.

Filed Aug. 1, 1969, Ser. No. 846,690
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **5 Claims**



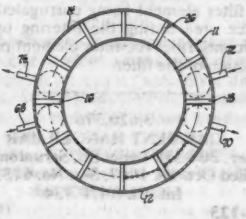
A skim tank for skimming surface water of a pool has an inlet from the surface of the pool to an upper part of the tank. A rotatable plate extending across the tank at a level below the inlet separates the upper tank portion from a chamber below the plate, and an opening through the plate permits the pool water from the inlet and upper tank portion to flow down to the chamber when the opening is not closed by a stopper, from where it is withdrawn through a conduit by a suction pump for filtering. A bypass conduit connects to the chamber from the pool such that when the stopper closes the opening, water is drawn into the chamber through the bypass line to supply the pump. The pool may be vacuum cleaned through a vacuum line connected at the opening of the plate and in order to close the bypass line during the vacuum operation, the rotatable plate is provided with a closure gate depending from it which blocks the inflow from the bypass to the chamber when the plate is rotated to the blocking position.

3,620,373

CLOSED-LOOP PROCESSING APPARATUS

Jesse D. Crell, White Plains, and Samuel Sze, Great Neck, both of N.Y., assignors to Trade Bank and Trust Company, New York, N.Y.

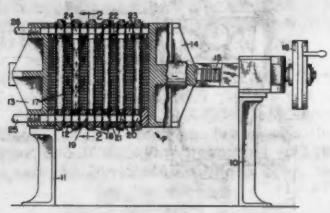
Filed Dec. 22, 1969, Ser. No. 887,171
Int. Cl. B01d *35/08*
U.S. Cl. 210—189 **9 Claims**



Apparatus for continuously processing fluids includes a hollow torus having a plurality of discs positioned therein

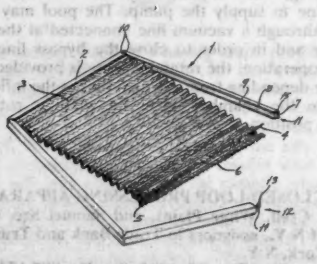
containing chemicals enclosed in filtering paper for processing the fluids. The discs are connected together and continuously driven around the enclosed circle formed by the torus. The torus is divided into two compartments by rubber dividers each having a diametrical slit through which the discs move when passing between compartments. The discs are normally disposed in a plane perpendicular to the movement of fluid through the torus but tilt into a plane parallel to the fluid movement when passing through the slits. Each compartment has a fluid inlet and outlet. In one compartment the fluid is filtered and chemically treated by passing through the discs. In the other compartment the discs are washed and the chemicals regenerated.

3,620,374
REINFORCED PLASTIC FILTER PLATE STRUCTURE
Robert J. Brinkema, Rochester, Mass., assignor to Joseph T. Kyerson & Son, Inc.
Division of Ser. No. 552,228, May 23, 1966, which is a continuation-in-part of Ser. No. 282,808, May 23, 1963, abandoned
Filed Sept. 14, 1967, Ser. No. 674,375
Int. Cl. B01d *25/12*
U.S. Cl. 210—231 5 Claims



An open rigid fiber glass reinforced laminated filter plate structure having reinforced members with intersections therebetween to provide supporting pillars.

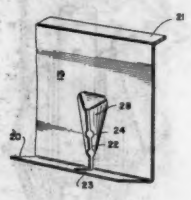
3,620,375
FILTER CONSTRUCTED OF METALLIC MATERIAL
Jack Atkins, 4408 Cherrydale Road, Memphis, Tenn.
Filed Sept. 8, 1969, Ser. No. 856,011
Int. Cl. B01d *25/06*
U.S. Cl. 210—484 2 Claims



In a filter for use in removing entrained matter contained in a flowing material, a series of superimposed layers of a metallic filtering composition forms an inner core that is encased intermediate a pair of outer coverings to form the filter element, said filter element being corrugated to enhance its exposed surface area during the filtering operation, and a rigid frame circumscribes the filter element providing rigidity in the construction of the filter.

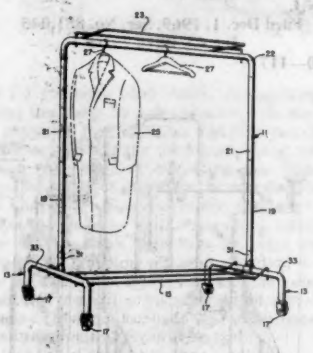
3,620,376
GARMENT HANGER BAR
Carl E. Gingher, 304-328 Depot St., Scranton, Pa.
Filed Oct. 16, 1967, Ser. No. 675,666
Int. Cl. A47f *7/24*
U.S. Cl. 211—123 13 Claims

A garment hanger bar wherein a horizontal member has a vertical wall and a horizontal flange with a transverse slot in the flange and vertical wall and an enlarged opening communicating with the wall portion of the slot so that the bar can support clothes hangers provided with stems having opposed parallel faces thereon with a protrusion on at least one face. The hanger bar slot is narrow and only slightly greater in



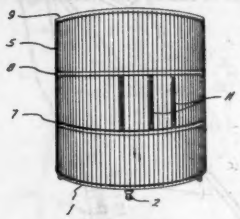
width than the thickness between the opposed faces of the hanger stem. The hanger bar may be in the form of an accessory which can be mounted on existing hanger bars to adapt an existing hanger bar to receive another type of clothes hanger stem.

3,620,377
CLOSET ACCESSORY CONSTRUCTION
Gilbert J. Holtz, 182 Tibbets Road, Yonkers, N.Y.
Filed Sept. 12, 1969, Ser. No. 857,505
Int. Cl. A47f *5/00*
U.S. Cl. 211—177 2 Claims



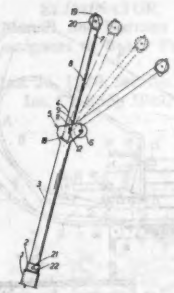
A closet accessory in the form of a hat, coat and shoe rack of the type transportable in a disassembled condition, including a number of hollow tubing structural members and with T-joints, between base members and upright members for example, of particularly simple and rugged construction formed by flattening an end portion of a hollow tube, curving it to conform to the curve of a tube to which it is to be joined, bending off the partially flattened and unflattened portions of the first tube at approximately right-angles to the round flat portion, and providing in the bend ridges with a curvature opposite to the bend. The flattened and formed tubing section described above is fastened, by spot welding for example, to the second piece of tubing which it is shaped to conform with to form a strong T-shaped tubing structure.

3,620,378
CARPET SAMPLE RACK
John C. Sweeney, Box 3406, Victoria, Tex.
Filed Oct. 3, 1969, Ser. No. 863,539
Int. Cl. A47f 5/00
U.S. Cl. 211—177 3 Claims



A device for storing and displaying carpet samples, having superimposed series of separated storage compartments and being of a construction permitting easy assembly of the rack at the desired location, providing maximum capacity in a minimum of space.

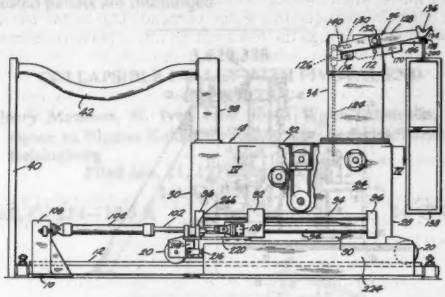
3,620,379
TELESCOPIC JIB WITH A TELESCOPIC INCLINABLE END MEMBER FOR CRANES
Jean Fauchere, 5, Rue Marcel Loyau, 92 Boulogne-sur-Sein, France
Filed Dec. 29, 1969, Ser. No. 888,726
Int. Cl. B66c 23/06
U.S. Cl. 212—55 3 Claims



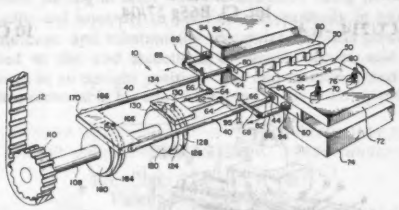
A telescopic jib for a crane, the jib being provided with an inclinable telescopic end element which is slidable in the internal element of the jib and can be fixed to this element in various positions when it is aligned therewith, by pinning or the like, and which when in a fully extended position can assume various inclinations relative to the jib, the said end element then being capable of pivoting around the fixing pin and of being fixed in the selected inclined position by means of another pin or the like.

3,620,380
TRANSFER DEVICE
Daniel J. Borodin, Detroit, Mich., assignor to U.S. Automation Company, Warren, Mich.
Filed Sept. 3, 1969, Ser. No. 854,862
Int. Cl. B66c 23/08
U.S. Cl. 214—1 BB 27 Claims

A device for transferring workpieces from one support to another, such as between a pair of conveyors. The device includes a track supported carriage on which a workpiece support arm is mounted for pivotal movement in a vertical plane. A pair of rotary cams are operatively connected, one between the carriage and the base on which it is supported and the other between the carriage and the support arm. One cam controls the translatory movement of the carriage on the base and the other controls the pivotal movement of the support arm so that by correlating the movement of the two cams any desired path of travel for the work-engaging portion of the support arm may be generated. The translatory movement of the carriage is also supplemented by a hydraulic cylinder operable in conjunction with the two rotary cams.



3,620,381
HORIZONTAL HIGH-SPEED TRANSFER
Stuart H. McCaughey, P.O. Box 255, Cockeysville Road, Cockeysville, Md.
Continuation-in-part of application Ser. No. 713,830, Mar. 18, 1968. This application Apr. 6, 1970, Ser. No. 25,725
Int. Cl. B65g 25/04
U.S. Cl. 214—1 7 Claims

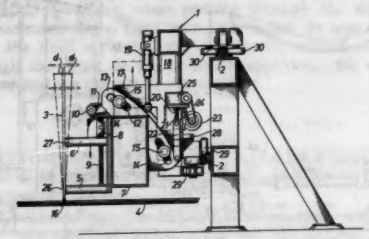


High-speed transfer apparatus for presses has spaced carrier bars with inward article receiving configurations. The carrier bars are mounted on carrier supports for longitudinal movement therewith and for relative transverse movement with respect thereto. The carrier bars are positively connected to the cam bars for lateral in and out movement therewith and for relative sliding. The carrier supports and cam bars are independently reciprocated in phase displaced relationship so the carrier bar moves forward after the cam bar has moved inward, and so the cam bar draws the carrier outward before the carrier is returned to its first position. The carrier and cam bar are reciprocated by separate rotating cams and followers. A cam flange extends radially outward from a cylindrical body and followers are mounted on opposite sides of the flange for continuous uniform direction rotation of the followers as the cam rotates, and the followers move slides which are connected to the cam bar and carrier bar.

3,620,382
DEVICE FOR CONVEYING REINFORCING ELEMENTS TO A WELDING STATION AND FOR HOLDING AND ALIGNING THESE IN RELATION TO A SHEET OF METAL AT THE WELDING STATION
Charles Gunnar Birger Bergling, Orebro, Sweden, assignor to Ingenjorsfirma Hebe AB, Orebro, Sweden
Filed June 5, 1970, Ser. No. 43,850
Claims priority, application Sweden, June 12, 1969, 8383/69
Int. Cl. B66c 1/06
U.S. Cl. 214—1 BT 5 Claims

A device is provided for conveying reinforcing or skeleton elements to a welding station and for holding and aligning

said elements in relation to a metal sheet at the welding station, said device comprising a traveling carriage having a box or beam construction movably and pivotally mounted thereon, electromagnets being attached to said box or beam construction for holding said reinforcing elements. The elec-



tromagnets are arranged in a lower and an upper row, the electromagnets in the lower row being fixed and the electromagnets in the upper row being displaceable, thus enabling the device to handle reinforcing elements of varying sizes.

3,620,383

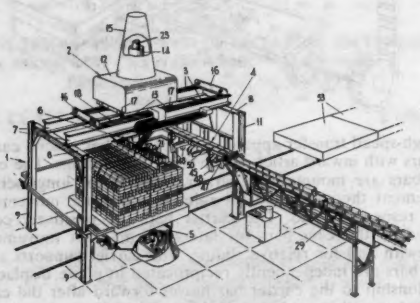
BRICK-HANDLING APPARATUS

David John Ingram, 40 Edendale Road, Barnhurst, Kent, and Geoffrey James Eagles, 31 Tradescant Drive, Meopham, Kent, both of England

Continuation-in-part of application Ser. No. 614,977, Feb. 9, 1967, now abandoned. This application Jan. 27, 1970, Ser. No. 6,271

Int. Cl. B65g *57/04*

U.S. Cl. 214—6 A **10 Claims**



Brick handling and stacking apparatus including a carriage mounted for movement on a gantry between a pickup station and a release station, a pickup head, mounted for vertical movement on a carriage, in the form of a plurality of platen members carried by support brackets slidably mounted on a horizontal support for movement to predetermined positions thereon, piston and cylinder units for moving the platen members along the support, and a plurality of stop members disposed at spaced positions adjacent the horizontal support.

3,620,384

TINE ARCH MECHANISM FOR A BALE WAGON

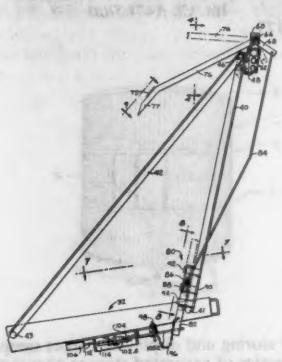
Jerry W. Welker, Selma, Calif., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed May 29, 1969, Ser. No. 828,882

Int. Cl. B65g *57/32*

U.S. Cl. 214—6 B **1 Claim**

A tine arch mechanism for a bale wagon comprising a plurality of tine members pivotally suspended above the load-carrying bed and adapted to be engageable with successive tiers of bales received on the bed to prevent the bales from falling forward during the loading or transporting thereof,



and movable out of engagement with the bale tiers to permit unloading of the bales from the bed.

3,620,385

CONVEYING APPARATUS FOR A MAGNETIC TAPE CARTRIDGE CHANGER

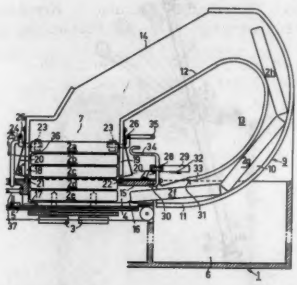
Leopold Petrus Johannes Vermeijlen, Emmasingel, Eindhoven, Netherlands, and Friedrich Laa, Vienna, Austria, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1969, Ser. No. 847,969

Claims priority, application Austria, Aug. 14, 1968, A 7973/68

Int. Cl. B65h *1/00*

U.S. Cl. 214—6 D **15 Claims**



A magnetic tape cartridge changer for playing a plurality of stacked tape cartridges in sequence. The changer is provided with a shaft for the storage of the stacked cartridges and has a lateral outlet aperture for automatic removal of the lowest stacked cartridge which is in the playing position. The removed cartridge is passed into a channel which ultimately feeds the cartridge back to a ready to play storage position in the shaft.

3,620,386

ACCUMULATOR FOR CARTONING MACHINE

Elbert L. Bivans; August Kund, both of Glendale, Calif., and Bivans Corporation, Los Angeles, Calif.

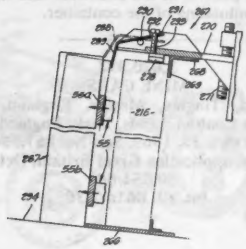
Filed Feb. 9, 1970, Ser. No. 9,724

Int. Cl. B65g *57/00*

U.S. Cl. 214—7 **6 Claims**

Automatic cartoning machine including twin cartoning units mounted in a common framework having a conveyor for conveying a stack of paper cups or other article for each unit. The units are similar having their loading stations adjacent each other to receive the articles. Each unit has a plurality of cams making one complete revolution for one cycle of operation. Each cycle includes removing a collapsed glue end carton from the bottom of a magazine, transferring it to

a combined loading and squaring-up station where the carton is squared up and the article is loaded into the carton. The cycle is started by arrival of the article at a station and is terminated by one complete revolution of the cams. The minor flaps pass through a glue applicator on the way to the station. After the flaps are partially sealed, the carton is elevated through a compression chute and the filled and sealed carton is then ejected horizontally and guided to fall in upright position in front of an accumulator which operates in timed relation with the supply of filled and sealed cartons and with the transfer of the article from the conveyor to a loading tray. Cam means controls supply of the upright cartons to a row former, a given carton pushing on the cartons ahead of it until the row is filled, the leading carton controlling a trigger to complete a power drive to eject the row as a unit, the individual cartons and the rows leaning downhill to form a compact group of rows of upright elongated cartons.

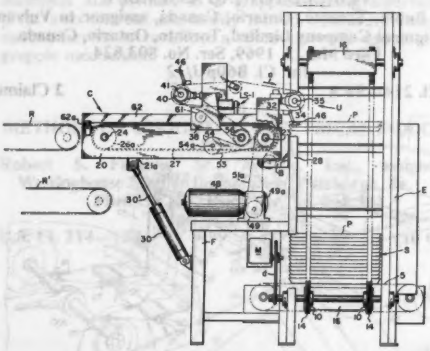


3,620,387

HOOK-TYPE PALLET UNSTACKER WITH DOUBLES ELIMINATOR

Ronald D. Elson, Merrill, and Norman O. Krenke, Saginaw, both of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Jan. 26, 1970, Ser. No. 5,576
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 A **15 Claims**



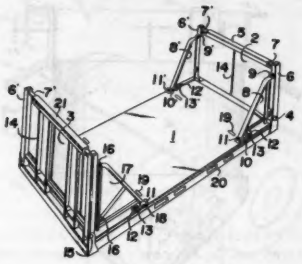
A hook-type pallet unstacker mounted adjacent the supply end of a pallet receiving conveyor for movement between a raised inoperative position and a lowered unstacking position for sequentially unstacking pallets from a stack and delivering them individually to the conveyor. The conveyor is pivotally mounted at its supply end and is movable from a first normally operative horizontal position in which it receives the unstacked pallets and conveys them in a first path of travel, if the pallets are unstacked singly, to and from a second downwardly tilted reject position in which it discharges the nested pallets which are delivered when more than one pallet is inadvertently simultaneously removed from the stack by the unstacker. Apparatus is provided for pivoting the conveyor to the reject position to lower the discharge end of the conveyor to discharge nested pallets along the second path of travel and to simultaneously raise the supply end of the conveyor, which raises the pallet unstacker to the inoperative position and prevents further unstacking until the nested pallets are discharged.

3,620,388

COLLAPSIBLE PALLET WITH PIVOTAL END SUPPORTS

Harry Mansson, St. Ives, New South Wales, Australia, assignor to Nippon Kokan Kabushiki and Rederiaktiebolaget Helsingborg

Filed Jan. 21, 1970, Ser. No. 4,612
Int. Cl. B65g *1/20*
U.S. Cl. 214—10.5 R **10 Claims**



A stackable collapsible pallet, suitable for carrying automobiles, having at least one end structure being pivotable outwardly and inwardly to positions substantially in parallel with the base, and substantially triangular supports pivotably attached to the end structures to rigidly secure said end structures in an upright position. The end structures and supports are removable for use of the base as an ordinary pallet.

ERRATUM

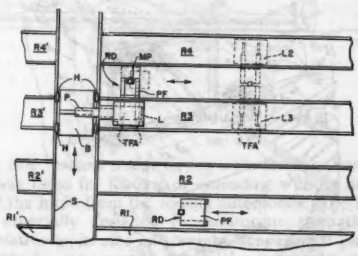
For Class 214—15 R see:
Patent No. 3,620,427

3,620,389

SYSTEM FOR TRANSPORTING GOODS TO AND FROM STORAGE SHELVES

Fredrik Munck, Bergen, Norway, assignor to Sverre Munck A/S.

Continuation-in-part of application Ser. No. 707,252, Feb. 21, 1968, now abandoned. This application Jan. 16, 1970, Ser. No. 3,290
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **5 Claims**



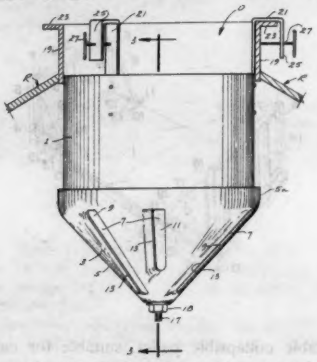
A system for transporting goods, e.g., pallets, containers or the like, to and from storage shelves arranged in parallel rows includes a transport carriage movable in guide rails along a path perpendicular to the shelves, the rows of shelves being

located on both sides of this path. The transport device includes a platform arrangement which may be raised and lowered and moved laterally of the carriage to effect loading and unloading. A receiving device is located between pairs of the rows and is adapted to transport the goods unloaded by the transport device to a predetermined location along the rows between which the receiving device is located.

3,620,390
APPARATUS FOR SPREADING PARTICULATE MATERIAL

Richard E. McKinnon, Taylorville, Ill., assignor to Specialized Products, Inc., Taylorville, Ill.

Filed Dec. 8, 1969, Ser. No. 882,998
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 CB **10 Claims**

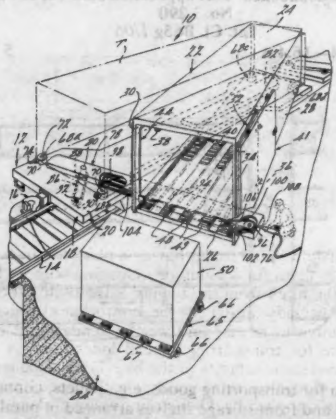


Apparatus for spreading particulate material, such as grain, in a circular bin having a roof and a center opening in the roof for the delivery of the material into the bin comprising a spinning cup having a conical annular wall of decreasing diameter from top to bottom and having openings in the wall for centrifugal discharge of the material from the cup with decreasing volume and velocity of discharge from top to bottom of the cup for evenly spreading the material around the bin.

3,620,391
RAILCAR UNLOADING SYSTEM

Richard T. Fujioka, Oxford, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Division of Ser. No. 697,427, Jan. 12, 1968, Pat. No. 3,548,756
Filed May 6, 1970, Ser. No. 35,027
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 A **22 Claims**

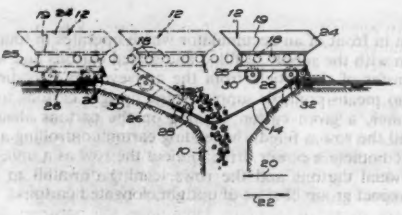


A loading and unloading system for a vehicle having a support frame and an enclosure adapted to be supported on the frame, the system comprising means for supporting the enclosure for movement relative to the frame about at least one generally vertical axis, whereby one end of the enclosure may be pivoted between a transit position overlying the frame and at least one loading or unloading position wherein the one end of the enclosure extends outwardly from the vehicle to provide for convenient end loading and unloading thereof, a cargo container adapted to be removably received interiorly of the enclosure, and means for moving said container longitudinally of the interior of the enclosure and thereby effecting loading and unloading of the container.

3,620,392
MINE CARS

Fred Greenwood, Tingley, Morley, England, assignor to Robert Hudson Limited, Leeds, York, England

Filed Oct. 20, 1969, Ser. No. 867,550
Claims priority, application Great Britain, Oct. 22, 1968, 50,054/68
Int. Cl. B61d *7/30*
U.S. Cl. 214—63 **3 Claims**

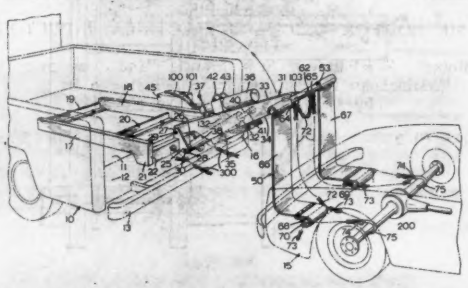


A mine car of a generally rectangular form of which the bottom can swing open to enable the car to discharge its contents. The wheels of the mine car are attached to the swingable bottom and the rear wheel assembly has an axle arrangement such that the rear wheels can straddle a guide rail which serves to maintain the open bottom in the desired position.

3,620,393
VEHICLE TOWING ASSEMBLY

Leslie Bubik, Toronto, Ontario, Canada, assignor to Vulvan Equipment Company Limited, Toronto, Ontario, Canada

Filed Mar. 3, 1969, Ser. No. 803,824
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **2 Claims**



The present invention is concerned with a low-cost vehicle tow unit which employs a boom so disposed and of such a shape that the necessity of the normal additional tow anchor bars for spacing the towed and towing vehicles is obviated. The boom has a rear surface behind the towing vehicle and the towed vehicle is brought into abutting engagement so that the boom serves both to lift and space apart the towed and towing vehicle.

3,620,394

LOGGING APPARATUS

Robert C. Symons, Woodstock; Stanley H. Koch, London, and John B. Pierce, Woodstock, Ontario, all of Canada, assignors to Timberjack Machines Limited, Woodstock, Ontario, Canada

Filed May 8, 1969, Ser. No. 822,986
Int. Cl. B66c 1/32
U.S. Cl. 214—147 G 18 Claims

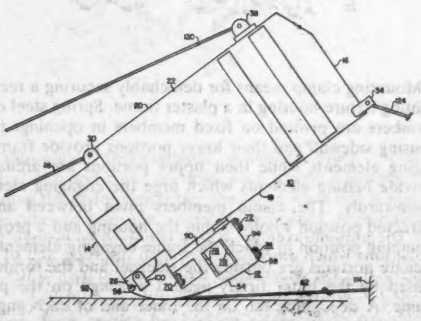
An apparatus for use in handling trees, logs, and the like comprises an articulated vehicle having front and rear vehicle sections which are interconnected for relative pivotal movement about a vertical axis. A boom structure is supported on the rear section and comprises a first boom member which is pivotally connected to the rear section and a second boom member which is pivotally connected to the first boom member. A first power means is interconnected between the rear vehicle section and the first boom section for pivoting the first boom section relative thereto. A second power means is pivotally interconnected between the rear vehicle section and the second boom section for pivoting the second boom section relative to the first boom section. The logging apparatus also includes a hoist or winch mechanism having a cable which is guided through a fair-lead assembly supported on the second boom section. The fair-lead assembly includes a horizontal roller and a pair of vertical rollers which are operative to guide the cable. A grapple mechanism is supported for universal movement on the outer end of the second boom section and includes relatively movable article engagement members or arms which are supported for relative pivotal movement. The grapple mechanism is constructed so that as the article-engaging members are pivoted in a grapple-opening direction, the pivot axes thereof are bodily moved outwardly away from each other so as to effect a relatively wide opening of the grapple mechanism.

3,620,395

METHOD FOR UPRIGHTING ELECTRICAL INDUCTIVE APPARATUS

Robert S. Farmer, Sr., Muncie, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1969, Ser. No. 866,341
Int. Cl. B65g 7/08
U.S. Cl. 214—152 10 Claims



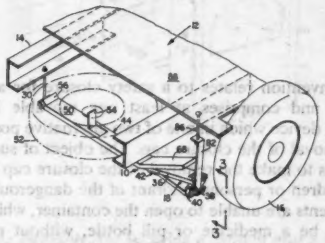
A method for uprighting electrical inductive apparatus after shipment in a horizontal position, including the steps of mounting a rocker assembly having a curved base to the underside of the inductive apparatus to be uprighted, rotating the inductive apparatus on the curved base for a predetermined portion of the uprighting cycle, restraining the inductive apparatus from suddenly completing its turning cycle, and controllably releasing the restraint on the inductive apparatus during the remaining portion of the turning or uprighting cycle.

3,620,396

SPARE TIRE CARRIER

Duane R. Abfalter, Sonoma, Calif., assignor to Travel Accessories Manufacturing Company, Inc., Orland, Calif.

Filed July 1, 1969, Ser. No. 838,068
Int. Cl. B62d 43/00
U.S. Cl. 214—454 14 Claims



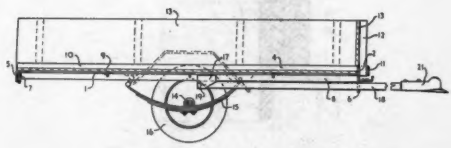
A carrier device for retaining a spare tire between body frame members of a truck which is movable and extendable to facilitate quick and easy removal of a tire from and return to its stowed position thereon. The device comprises an elongated extendable unit pivotally connected to one truck frame member at one end and releasably connected to the truck body at the other end. The tire is attached to an upper member of the unit so that, when released, it can be moved from its stowed position while supported by a lower member of the unit.

3,620,397

TILTABLE TRAILER

Robert Gagnon, Box 46, Val Caron, Ontario, Canada

Filed Oct. 6, 1969, Ser. No. 864,074
Int. Cl. B60p 1/28
U.S. Cl. 214—506 3 Claims



A single axle, vehicle trailer having a platform, or box, that can be easily tilted for loading or unloading without disconnection of the hitch from the towing automobile. The trailer frame is especially designed for antitorque strength and rigidity, relative to its size and weight, rendering it particularly suitable for transporting special loads such as one or two motorized snow vehicles or the like. Four angle members outline the elongated rectangular wheel-carried frame that has a uniquely applied backbone reinforcing it along the longitudinal median and to which backbone the draft tongue or tow bar is pivotally connected.

3,620,398
SAFETY CLOSURE

Charles Martinus Bech Andersen, Naerumvaege 122, 2850 Naerum, Denmark

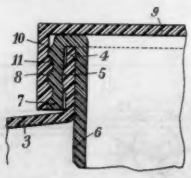
Filed July 29, 1969, Ser. No. 845,688
Claims priority, application Denmark, July 29, 1968, 3650/68 May 6, 1969, 2468/69
Int. Cl. A61j *1/00*; B65d *55/02*
U.S. Cl. 215—9 11 Claims

This invention relates to a safety closure for a container opening and comprises at least one movable locking or coupling device which in one of two alternative positions permits removal of the closure cap. The object of such a safety closure is to make the removal of the closure cap so difficult that children or persons ignorant of the dangerous nature of the contents are unable to open the container, which may for instance be a medicine or pill bottle, without making the opening of the bottle so difficult that it causes problems to the legitimate user. The known art comprises safety closures of this type with a built-in combination lock consisting for instance of two discs with notches that are to be placed in a definite relative position in order that the locking device can be released and permit removal of the closure. Such safety closures it is true do have the desired effect, but they inevitably get so complex that they will tend to increase the price of the whole packaging comprising container and closure.

3,620,399
DOUBLE-WALLED CONTAINER

Michel Rapeaud, 9 rue Marceau-Delorme, 92 Asnieres, France

Filed Feb. 14, 1969, Ser. No. 799,440
Claims priority, application France, Feb. 14, 1968, 139,825
Int. Cl. A47j *41/00*
U.S. Cl. 215—13 2 Claims

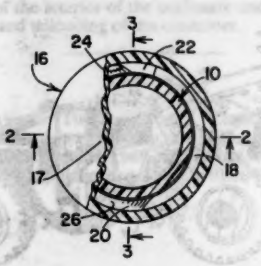


A double-walled container comprises an outer casing of relatively rigid plastic material formed with an upstanding cylindrical collar from which the upper edge of a concave-bottomed inner cup, which is folded on itself through 180°, is suspended straddlewise. The inner cup is of relatively flexible plastic material and the outer surface of the folded edge and the inner surface of a closure member being formed with companion threads for sealing the assembly. The upstanding collar is formed on its outer surface with a shallow projection for engagement by the registering inner surface of said folded edge of the inner cup.

3,620,400
CLOSURES FOR BOTTLES AND THE LIKE

Morris Braun, Chicago, Ill., assignor to W. Braun Company

Continuation of application Ser. No. 664,490, Aug. 30, 1967, now Patent No. 3,511,403. This application May 6, 1970, Ser. No. 35,063
Int. Cl. B65d *41/06*
U.S. Cl. 215—44 11 Claims

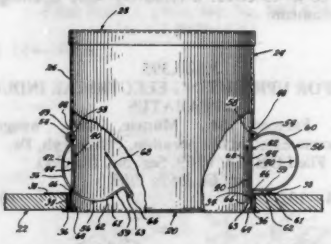


A container having a neck portion formed of a resilient or flexible material having an uninterrupted external helical thread of constant pitch and a mating screw-type closure cap having internal threads of constant pitch, the continuity of the threads on the cap being interrupted at spaced points to from gaps and abutment shoulders adjacent the gaps. When the cap is screwed tightly on the neck portion the cooperating threads of the container neck are deformed into the gaps in the threads of the cap to cooperate with the abutment shoulders to lock the cap against inadvertent displacement.

3,620,401
RECESSED LIGHTING FIXTURE INCLUDING MOUNTING CLAMP MEANS

Alvin R. Lund, Carpentersville, Ill., assignor to Markstone Manufacturing Company

Filed May 11, 1970, Ser. No. 36,060
Int. Cl. H02g *3/08*
U.S. Cl. 220—3.6 12 Claims



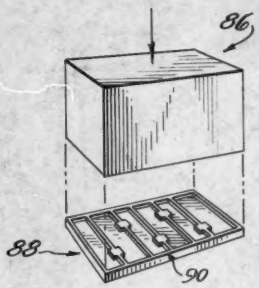
Mounting clamp means for detachably securing a recessed lighting fixture housing in a plaster frame. Spring steel clamp members are pivoted on fixed members in openings in the housing sidewall and their lower portions provide frame-engaging elements while their upper portions are arcuate to provide biasing elements which urge the engaging elements downwardly. The clamp members pivot between an idle retracted position wholly within the housing and a projected clamping position in which the frame-engaging elements and arcuate portions are outside the sidewall and the former are biased by the latter firmly against a flange on the plaster frame. A depending tab on the inner end of each engaging element abuts the sidewall to limit outward movement of the clamp means, and an elongated upright flap above the tab closes the opening the sidewall in the projected position.

3,620,402

CONSTRUCTION OF POLYOLEFIN CONTAINERS

Robert J. Wentland, Hinsdale, Ill., assignor to The Richardson Company, Melrose Park, Ill.

Filed Aug. 28, 1969, Ser. No. 853,790
Int. Cl. H01m *1/02*; B65d *11/10*
U.S. Cl. 220—4 R 5 Claims



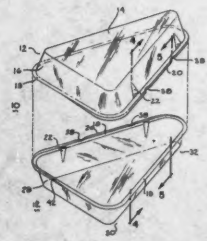
A container constructed at least partially of polyolefin and the remainder of a rubber composition or other easily bondable material, is made with at least one airtight seal with an excellent bond strength which is formed from mating surfaces of adjoining sections of the container wherein at least one of the sections is polyolefin. As illustrated by a thin-walled, electric storage-battery container constructed of polypropylene having multicompartments wherein each compartment is to be isolated from the others, the seals are formed by oxidizing the adjoining surfaces preferably by an oxidizing flame and by applying a curable adhesive on the oxidized surfaces to form the desired bond.

3,620,403

PLASTIC FOOD CONTAINER

John H. Rump, Rockville, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1969, Ser. No. 877,957
Int. Cl. B65d *11/10*, *43/10*
U.S. Cl. 220—4 E 3 Claims



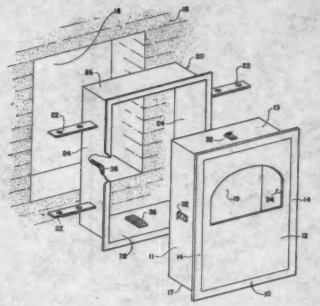
A thin-walled thermoplastic container which includes identical dish and cover portions, each having a peripherally extending flange for supporting the other when one is placed on the other to form the assembled container. A restraining collar extending from the flange in the direction of the sidewall prevents crosswise displacement in one direction of one portion with respect to the other, while stabilizing posts in the sidewalls prevent such displacement in the opposite direction. Each portion has locking means which coact with the flange of the other and self engage when one portion is forced against the other.

3,620,404

FASTENER ASSEMBLY FOR MOUNTING OF WALL-RECESSED CABINETS AND SIMILAR FIXTURES

Joseph C. Grasso, New York, N.Y., assignor to Accessory Specialties, Inc., New York, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,207
Int. Cl. B65d *25/24*
U.S. Cl. 220—18 1 Claim



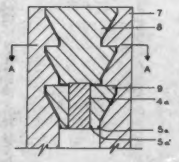
A fastener assembly, for securing a cabinet into a subframe previously installed in a masonry wall opening, in the form of a flexible spring clip hooking into one of the notches on a serrated anchorplate, with one of said fastener elements being secured by pop rivets to each outer side surface of said cabinet and the other fastener element being affixed to corresponding locations on the inner side surfaces of said subframe.

3,620,405

CLOSURE SYSTEM FOR HIGH-PRESSURE VESSELS

Henning Peters, Brugge, Westfalen, am Kamp, and Klaus-Dieter Solmecke, Gevelsberg, both of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Filed June 1, 1970, Ser. No. 41,860
Claims priority, application Germany, June 3, 1969, P 19 28 169.7
Int. Cl. B65d *41/06*
U.S. Cl. 220—40 5 Claims



A closure for the open end of a high-pressure vessel is formed of two or more plugs, in the nature of pistons that cooperate to seal the end of the vessel, each of which is supported by engagement with a portion of the wall of the vessel different from the portion or portions supporting the other plug or plugs. The plugs may be in the form of a cylindrical piston, and encircling annular pistons or a series of plugs with varying effective areas. The plugs themselves or through intermediate members are individually supported from axially spaced portions of the vessel wall.

3,620,406

PULL TAB AND PRESSURE RELIEF VALVE

Joseph H. Evans, Palo Alto, and Fred Eugene Weir, Atherton, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 29, 1969, Ser. No. 888,793
Int. Cl. B65d 51/16
U.S. Cl. 220—44 7 Claims

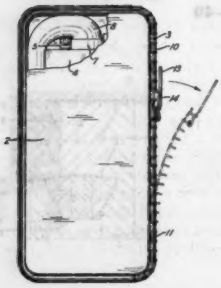
A pull tab for a pressurized container which can be manually removed to release the fluid under pressure and which also operates as a relief valve if the internal pressure in the container exceeds a desired level. The tab is formed in place by placing a piece of heat-recoverable plastic tubing or rod in one or more appropriately sized holes in the container and then expanded by heat to block the hole. The plastic tubing or rod then acts as a valve which relieves the container pressure upon its removal.

3,620,407

EASY-OPEN SEALED CONTAINER

Layton A. Wise, Washington, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 29, 1970, Ser. No. 6,748
Int. Cl. B65d 7/00, 53/00
U.S. Cl. 220—46 R 2 Claims



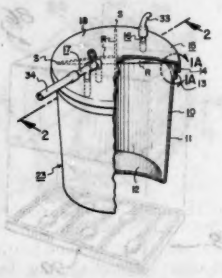
A case has a back and a cover provided with sidewalls surrounded by outwardly extending flanges at their free edges for engaging a flexible sealing gasket between the flanges. Surrounding the gasket is a clamping wire that is bent to form spaced loops extending inwardly over the case flanges and pressing them toward each other to clamp the gasket between them. Connected to one end of the wire is means for pulling it outwardly away from the case so that the cover can be removed.

3,620,408

VACUUM-FILLED FLUID BOTTLE AND SYSTEM

LeGrand K. Holbrook, and David S. Ostler, both of Salt Lake City, Utah, assignors to Medical Development Corporation, Salt Lake City, Utah

Filed Nov. 13, 1969, Ser. No. 876,438
Int. Cl. B65d 47/12
U.S. Cl. 220—60 R 6 Claims



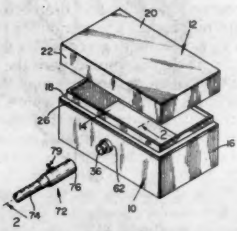
The present invention comprises a vacuum-operated, fluid-collection bottle and system. Structural advantages of the invention reside in increasing the effective seal area as between the cover and container of the bottle, as well as providing a tapered cam surface area receiving the bead of the container into the bead recess cover of the bottle. Dual vacuum bosses, one being valved, in multiple-boss covers may be used as respective automatic shutoff and tandem-fill means, with the nonapplicable boss being releasably capped off. Two of the three conduit portions of the cover may be connected together through appropriate valving system so that either or both may be effective in supplying vacuum communication to the interior of the bottle at selected height levels. Valving means predetermine maximum fluid height within the bottle, either automatically or by valve adjustment.

3,620,409

STORAGE CHEST FOR SILVERWARE OR THE LIKE

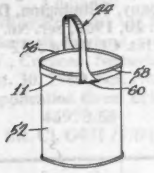
Milton Rosenbaum, 3648 Lynn Lane, Wantagh, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,301
Int. Cl. B65d 25/00
U.S. Cl. 220—85 R 4 Claims



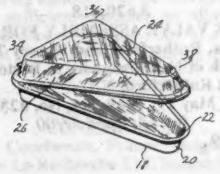
A chest, or like container, for preserving silver or like surfaces against tarnishing, including a receptacle and cover assembly adapted to interfit in airtight relation, and an air exhaust valve set into a wall of the chest, said valve adapted to connect with an air exhaust pump and sealed by the atmospheric air pressure when the interior of the chest is exhausted and responsive to a manual operation for opening, to equalize the pressure on the interior and exterior of the chest.

3,620,410
PLASTIC BAIL FOR CONTAINER AND METHOD OF ATTACHING BAIL
Elmer W. Griese, Jr., Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.
Filed Apr. 20, 1970, Ser. No. 30,172
Int. Cl. B65d 25/28
U.S. Cl. 220—94 R 13 Claims



A container handle made from a single flat sheet of resilient material and having an annular member including rectilinear side portions and arcuate end portions with a bail extending from the outer edge of the angular member and having a central rectilinear section spaced from one of the side portions and integrally joined with each of the end portions. The container handle is attached to a container body by encircling the body with the annular member adjacent one end and seaming an end to the body in a manner to crimp at least a portion of the annular member between the body and the seam.

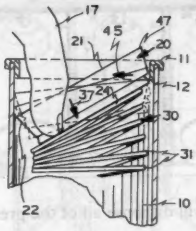
3,620,411
PLASTIC FOOD CONTAINER
John H. Rump, Rockville, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Nov. 19, 1969, Ser. No. 877,956
Int. Cl. B65d 43/16, 1/26
U.S. Cl. 220—31 S 2 Claims



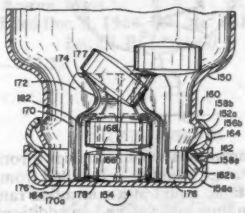
A one-piece, transparent, thin-walled food container suitable for use in vending machines and thermoformable from a single sheet of thermoplastic. The container includes a shallow dish portion out of which the contents may be eaten, a cover portion and a hinge continuous with the dish and cover portions to facilitate opening and closing thereof. One of these portions includes locking means which are self engaging when one portion is forced against the other. A stabilizing post in the cover portion substantially opposite the hinge prevents crosswise displacement of the cover portion with respect to the dish portion of the container.

3,620,412
PACKAGE FOR RESILIENT ELEMENTS OR THOSE STORED UNDER SPRING PRESSURE
Ira Leonard Eisner, 93 Woodridge Drive, Stamford, Conn.
Filed Dec. 5, 1969, Ser. No. 882,465
Int. Cl. B65h 1/12
U.S. Cl. 221—58 15 Claims

A package for storing resilient elements such as automotive springs, foam pads or hair rollers, stacked one upon the other, in which a container is provided at one end with a member which supports and prevents passage of the element to be stored, and at the other end with an interior lipped edge which permits passage of the element. The elements are held in compressed configuration by a flexible, distortable cup that is shaped such that its top edge abuts the lip of the container, thus causing closure of the container. To remove the resilient element, pressure is applied to one side of the upper edge of the cup so as to tilt and distort the cup, permitting its removal. The spring tension under which the resilient elements are stored then forces them out of the container. The principle is also applied to the storage of non-resilient elements under spring pressure.



3,620,413
DISPENSING CLOSURE DEVICE FOR TABLET CONTAINER
Adolph W. Borsum, 521 Pacific Ave., Solana Beach, Calif.
Filed Aug. 11, 1969, Ser. No. 848,980
Int. Cl. B65d 83/04
U.S. Cl. 221—289 6 Claims

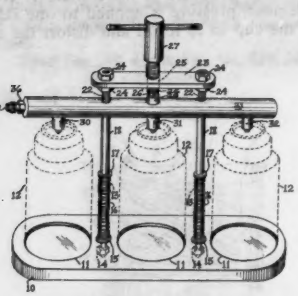


A closure device for a tablet container that controls the rate and number of tablets dispensed through an opening in the container, which device includes an expandable dispensing opening that is resiliently biased to a narrow channel that restricts passage of tablets therethrough. The channel is enlarged by pressing a cap member thereagainst, which cap member has a surface that coacts therewith, expanding the channel radially outward to pass a selective number of tablets into a tablet receptacle portion. The cap member has a lip that coacts with a lip on the dispensing opening to provide a lockseal closure of the container. The resilient force that narrows the channel may also exert force against the cap member in an axial direction to further lockseal the closure device.

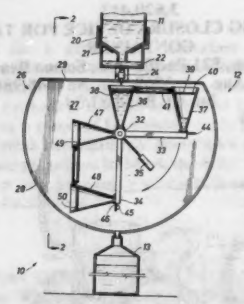
3,620,414
DISPENSING UNIT FOR SEALED PRESSURIZED CONTAINERS
Virgil Philipps, Chicago, Ill., assignor to Federal Auto Products Co., Inc., Chicago, Ill.
Continuation-in-part of application Ser. No. 869,592, Oct. 27, 1969. This application May 25, 1970, Ser. No. 40,103
Int. Cl. B67b 7/24
U.S. Cl. 222—5 2 Claims

A dispensing unit for simultaneously puncturing a plurality of sealed pressurized containers so that each container has open communication with a common dispensing tube that in

turn has a closed valve end which, when threadably connected to a hose, will dispense all of the pressurized contents of the containers.

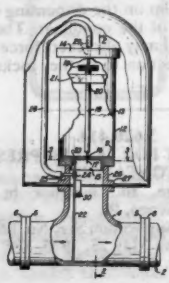


3,620,415
TIMED MATERIAL-DISPENSING MECHANISM UTILIZING ACCUMULATION OF A LIQUID
Arthur P. Ruth, 2302 Brookmere, Houston, Tex.
Filed Apr. 23, 1969, Ser. No. 818,716
Int. Cl. G01f *11/10*
U.S. Cl. 222—57 **11 Claims**



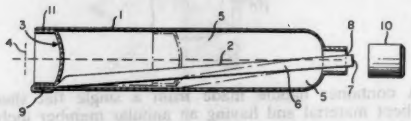
A water wheel apparatus which includes a rotatable shaft, a first storage container adapted to be filled from a source of water or other suitable liquid at a controlled rate, the filling to require a certain time interval, and an additional or second container communicated with the first and providing starting torque for rotation of said shaft. Duplicate containers are arranged on the water wheel to provide for continued rotation or oscillation of the shaft, there being a stop means to locate the first container for refilling.

3,620,416
SEWAGE CHLORINATOR
Fred W. Beutnagel, 1952 Woodland, Sequin, Tex.
Filed Apr. 2, 1970, Ser. No. 25,201
Int. Cl. B67d *5/08*
U.S. Cl. 222—59 **10 Claims**



A device is provided in order to gradually add small quantities of an antiseptic solution, sodium hypochlorite for instance, to the overflow conduit from a septic tank, said conduit leading to an absorption field. The device operates to add the chlorinating fluid, for instance, only when there is a quantity of flowing sewage in the conduit leading to the said absorption field.

3,620,417
PACKAGE-DISPENSING DEVICE
John A. Simms, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 20, 1969, Ser. No. 878,324
Int. Cl. B67d *5/52*
U.S. Cl. 222—136 **4 Claims**



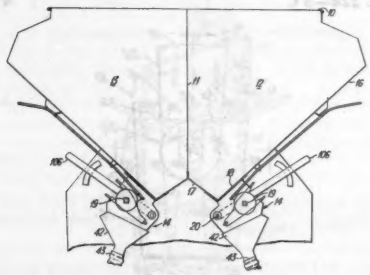
A device capable of containing and dispensing a plurality of separate extrudible materials which comprises:
a. a hollow casing having an orifice at each end;
b. at least one flexible duct being longitudinally disposed inside the casing, one end of said duct being sealed and attached to the casing at a point near one of the orifices of the casing, and the other end of said duct having an orifice which is inserted in the other orifice of the casing;
c. a plunger that is inserted in the orifice of the casing near which the duct is attached, said plunger having its outside periphery in close proximity to the inside walls of the casing so as to form a seal therewith; and
d. means capable of moving said plunger to the opposite end of the casing thereby simultaneously (1) causing the expulsion of the extrudible materials contained in the casing and (2) compressing the flexible duct and causing the expulsion of the extrudible materials contained therein.

3,620,418
RETAINER VALVE ASSEMBLY FOR SYRINGE
Frank W. Stevens, Rutherford, and Harvey Theodore Young, Rockaway, both of N.J., assignors to Becton Dickinson and Company, East Rutherford, N.J.
Filed May 29, 1969, Ser. No. 828,992
Int. Cl. B65d *37/00*
U.S. Cl. 222—209 **5 Claims**

A retainer valve assembly for a syringe including a body portion with means thereon for mounting the valve assembly in the barrel of a syringe. The assembly also includes a valve portion movably mounted on the body portion and normally being seated in a central opening in the body portion to form a seal and isolate one end portion of the syringe from the other end portion. The valve member is responsive to a predetermined amount of pressure from either end portion of

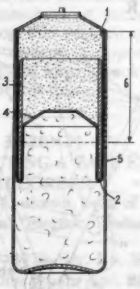
the syringe so that it will unseat from the body portion when the pressure is applied to permit fluid to flow from one end portion of the syringe to the other end portion. When the pressure is relieved, the valve member will return to its normal seated position to thereby re-form the seal between the end portions of the syringe and alleviate the danger of leakage from the syringe when the predetermined amount of pressure is not being applied.

3,620,419
METERING DEVICES
Alfred J. Bailey, Berkeswell, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands
Filed Sept. 30, 1969, Ser. No. 862,236
Claims priority, application Great Britain, Oct. 3, 1968, 46970/68
Int. Cl. G01f *11/06*
U.S. Cl. 222—298 **10 Claims**



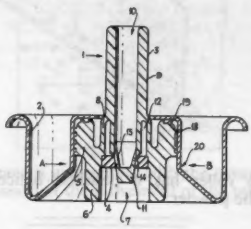
A metering device for seed comprising a body, a rotary metering member with a fluted portion for conveying seed, a cylindrical portion, a sealing disc with a central hole of complementary configuration to the fluted portion of the metering member, and a spring clip for holding the sealing disc in operating position. By releasing the spring clips, the sealing disc and the metering member can be moved toward one side of the device a sufficient distance to allow the metering member to be withdrawn from the body in a direction transverse to the axis of rotation of the metering member.

3,620,420
CONTAINERS
Norbert Normos, Courbevoie, France, assignor to La Societe Financiere Pour La Recherche Et L'Industrie, Paris, France
Filed Feb. 2, 1970, Ser. No. 7,663
Claims priority, application France, Feb. 3, 1969, 6,902,361
Int. Cl. B67d *5/54*
U.S. Cl. 222—386.5 **17 Claims**



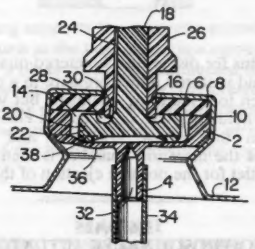
The container for a product to be dispensed by a pressurized fluid includes a diaphragm of baglike configuration preferably formed of ductile metal and having a rigid base. A hollow, ring or cup slidably mounted within the diaphragm and container has a rounded end wall over which the diaphragm slides as the product is being dispensed.

3,620,421
VALVES FOR PRESSURIZED LIQUID CONTAINERS
Richard Terence MacGuire-Cooper, Oxon, England, assignor to Oxford Aerosols Limited, London, England
Filed Oct. 16, 1969, Ser. No. 866,988
Claims priority, application Great Britain, Oct. 21, 1968, 49,844/68
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.21 **21 Claims**



A valve member which is a single moulding able to form a valve device with an annular member to be held in an annular cavity defined by and within the moulding, the moulding having an integral spring which allows relative movement between the annular member and a further portion, which is integral with the moulding and encircled by the spring, to open a fluid path which is normally closed by the abutment of said annular member and said further integral portion.

3,620,422
AEROSOL VALVE WITH FLEXIBLE HOUSING
Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 5, 1969, Ser. No. 882,485
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.22 **4 Claims**

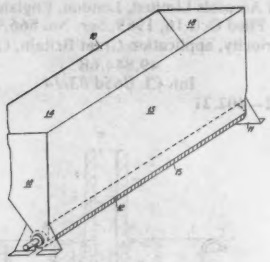


An aerosol dispenser valve comprising a housing forming a chamber in which is disposed a valve member. The valve member is movable, as by pressure exerted thereon by an operator, against a portion of the housing and operates to deform the housing portion to permit flow through the valve. Upon release by the operator, the housing portion returns to its original form, moving the valve member back into a valve-closing position.

3,620,423
APPARATUS FOR DISTRIBUTING POWDER
James Dalgleish, Edinburgh, Scotland, assignor to Golden Wonder Limited
Filed July 23, 1969, Ser. No. 844,145
Claims priority, application Great Britain, July 23, 1968, 35,054/68
Int. Cl. G01f *11/20*
U.S. Cl. 222—414 **8 Claims**

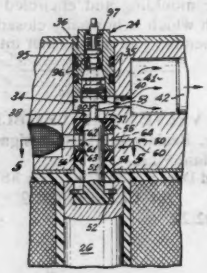
Apparatus for sprinkling a curtain of powder on to food passing beneath and comprising a hopper with a grooved me-

tering roller controlling the discharge from a bottom outlet,



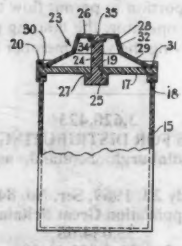
wherein the roller has a polished helicoidal groove for picking up the powder.

3,620,424
METERED FLUID DISPENSING APPARATUS
Gilbert R. Grigsby, Los Angeles, Calif., assignor to Lubrastart International, Los Angeles, Calif.
Filed Apr. 30, 1969, Ser. No. 820,396
Int. Cl. G01f 11/30
U.S. Cl. 222—450 **8 Claims**



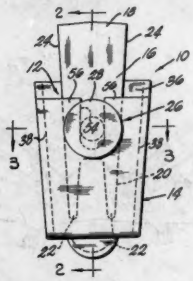
An apparatus for dispensing a metered quantity of fluid, in which the fluid is stored under pressure in a container that is normally open to a metering chamber, but which, when the apparatus is actuated, has valve means closing the connection between the storage container and the measuring chamber, and the measurin chamber is then connected to a discharge outlet for the positive ejection of the fluid.

3,620,425
AEROSOL VALVE ACTUATOR
Joseph M. Rait, Buffalo, N.Y., assignor to Pelorex Corporation, Buffalo, N.Y.
Filed Oct. 27, 1969, Ser. No. 871,466
Int. Cl. B67d 5/06
U.S. Cl. 222—518 **6 Claims**



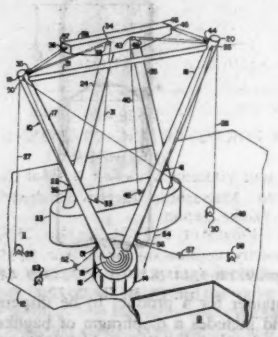
A dispenser for aerosol containers comprising a container end wall member having a bore therethrough and an upstanding rim provided with spaced slots. A shank extends through the bore and is provided with a valve at its inner end and a flexible operating member at its outer end. The operating member has a downwardly flaring flexible skirt with the marginal edges thereof bearing against the outer surface of the end wall member to flexibly urge the shank outwardly and seat the valve. The marginal edges of the skirt have diametrically opposed projections which normally engage the interior of the rim to prevent actuation of the valve. The operating member must be rotated to align the projections with the slots in the rim before the operating member may be depressed to unseat the valve and effect dispensing of the aerosol contents.

3,620,426
GOLF TOOL AND CARRIER THEREFOR
Raymond R. Hatch, 8155 Huron St., Dexter, Mich.
Filed May 13, 1970, Ser. No. 36,933
Int. Cl. A45f 5/00
U.S. Cl. 224—5 C **4 Claims**



A golf green repair tool and golf ball marker assembly and a carrier therefor wherein the tool and marker assembly consists of a flat body member having a first handle portion and a second prong portion and said ball marker is mounted on said body member between said portions so as to form an annular space between the head of the marker and the body member. The carrier consists of a pocket shaped to receive the body member and provided with a slot which extends into the annular space so that the head of the marker is disposed outside the pocket and the slot acts to retain the body member in the pocket. A spring clip connected to the pocket adapts the carrier for mounting on the golfer's belt and/or an equivalent support.

3,620,427
HOISTING APPARATUS FOR HANDLING CARGO
William S. Dodge, 408 Fair Haven Road, Alameda, Calif.
Filed July 2, 1970, Ser. No. 51,917
Int. Cl. B63b 27/02
U.S. Cl. 214—15 R **11 Claims**



Hoisting apparatus for handling cargo including a ball-and-socket joint secured to a support surface and having an up-

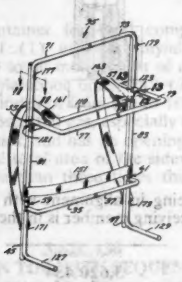
wardly and outwardly extending V-shaped truss consisting of a pair of booms joined at their upper ends by a rigid span. A mast house is disposed rearwardly of the booms and stabilizing lines are connected to both a prime mover and the free ends of the booms. First and second topping lines extend between the mast house, a prime mover, the crosstree on the mast house, and the free ends of each of the booms for respectively raising, pivoting and positioning the booms while first and second hoisting lines extend between the cargo to be hoisted, each of the booms, and a prime mover for respectively raising, transferring and lowering the cargo.

3,620,428

CONVERTIBLE BACKPACK AND COT APPARATUS

John D. Silverthorne, 3330 Mana, Long Beach, Calif.

Filed June 8, 1970, Ser. No. 44,307
Int. Cl. A45f *3/00*
U.S. Cl. 224—25 A **5 Claims**



Convertible backpack and cot apparatus including a breakdown, rectangularly shaped, tubular cot frame including first and second pairs of frame elbow members forming the corners thereof and first and second pairs of tee devices connectable with the ends of the side runs of such elbow members. Side members connect on their opposite ends with the tee devices and crossmembers connect on their opposite ends with the confronting end runs of the elbow members. First and second U-shaped leg means are provided for connection on their opposite ends with the respective first and second pairs of tee devices and include respective pairs of leg elbow members which have their horizontal runs connected together by horizontal members. Thus, the cot frame may be assembled with a cot canvas stretched thereon and when camp is broken the cot frame may be knocked down and one pair of elbow members connected together on their respective one ends to form one end of a pack frame and the first pair of the devices connected to the opposite end of such one pair of elbow members, the horizontal members connected on their respective one ends with such first tee devices and the second pair of tee devices connected with the opposite ends of the horizontal members. A second pair of elbows may then be connected together on their respective one ends and connected on their respective opposite ends with the second pair of tee devices to form a backpack frame that is narrower in width than the cot frame.

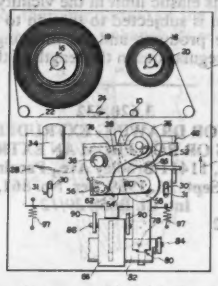
3,620,429

DEVICE FOR DETECTING A TAPE END IN A TAPE RECORDER

Isao Kozu, and Yikitada Ayukawa, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Apr. 3, 1970, Ser. No. 25,529
Claims priority, application Japan, Apr. 8, 1969, 44/28515
Apr. 9, 1969, 44/28430 Apr. 7, 1969, 44/28467
Int. Cl. B65h *25/32*
U.S. Cl. 226—11 **5 Claims**

A device to detect the arrival of a tape end when movement of the tape is terminated includes a capstan driven by a motor. A pressure roller is rotatably mounted on an arm to move a tape by means of cooperation with the capstan. A rotating member is rotatably mounted on the arm coaxially with the pressure roller and is driven by the capstan. An actuating element is mounted fixedly on the rotating member,



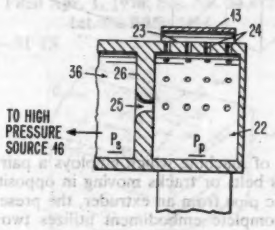
and a driven means is engageable with the actuating element upon the termination of the movement of the tape.

3,620,430

CONSTANT MASS FLOW PRESSURIZED AIR BEARING

Gerald W. Baumann, Boulder; Richard E. Norwood, Boulder, and William J. Rueger, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1970, Ser. No. 16,870
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 **8 Claims**



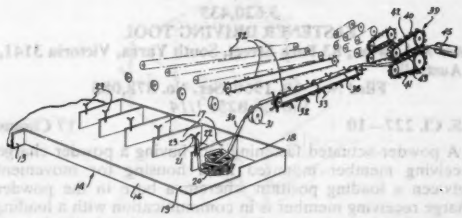
An air bearing supports the magnetic recording tape of a magnetic tape unit as the tape moves in a curved path, the air bearing having a plenum chamber connected through an orifice to a high-pressure source of air, the pressure magnitude of the source being such that over the operating range of the bearing, the mass rate of air flow into the plenum chamber, and thus out of the bearing to support the tape, is substantially constant.

3,620,431

PROCESSING OF SAUSAGELIKE PRODUCTS

William R. J. Wallace, Montreal, Quebec, Canada, assignor to Hygrade Foods, Inc., Montreal, Quebec, Canada

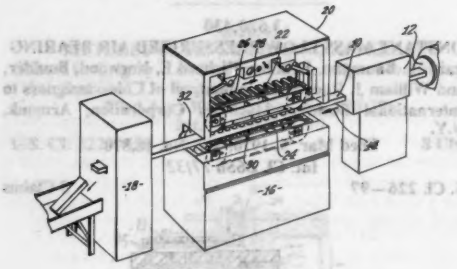
Division of Ser. No. 547,572, May 4, 1966, Pat. No. 3,505,081
Filed Aug. 14, 1969, Ser. No. 850,123
Int. Cl. B65h *17/00*
U.S. Cl. 226—109 **8 Claims**



Apparatus and method for improving the transportation of a chain of cased sausage products interconnected by untied,

twisted links of casing material. To reduce the tendency to untwist during subsequent handling (e.g. cooking) the sausages are squeezed transversely to strain the casing material beyond its elastic limit in the vicinity of the links. In addition the chain is subjected to tension to ensure registration between the products and an indexing conveyor, regardless of any irregularities in the length of the links.

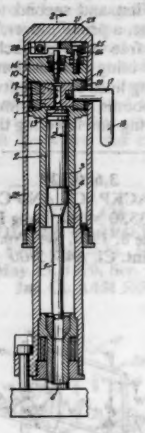
3,620,432
MACHINE FOR DRAWING EXTRUDED PLASTIC TUBING OR ROD FROM AN EXTRUDER
Vernon V. Emery, 11411 Bradley Ave., Pacoima, Calif.
Filed Sept. 26, 1969, Ser. No. 861,407
Int. Cl. B65h *29/12*
U.S. Cl. 226—172 **10 Claims**



In the type of machine which employs a pair of opposed driven endless belts or tracks moving in opposite directions to draw plastic pipe from an extruder, the present invention in its most complete embodiment utilizes two such pairs, both of which are disposed about a common axis, with each pair being normal to the other pair. Both of these pairs of tracks are displaceable radially with respect to such axis, preferably with one pair of tracks operable to come together completely and the other only to a distance at least as great as the width of the other pair of tracks. This displacement is accomplished by means of double acting fluid actuated piston-cylinder units, one end of which is secured to a frame supporting and/or housing the tracks, and the other end linked to displace the end or ends of one or more transverse element supporting the tracks. In the embodiment in which two pairs of tracks are employed, the displacement of the support elements for each pair of tracks may be accomplished simultaneously by crank actuated rotating sprocket elements which are connected for rotation by an endless chain to a crank driven sprocket which is operated by a double acting piston-cylinder unit connected to the crank. Continuous driving of all the tracks during displacement may be accomplished by the use of pairs of universal joints in conjunction with rotating drive rods.

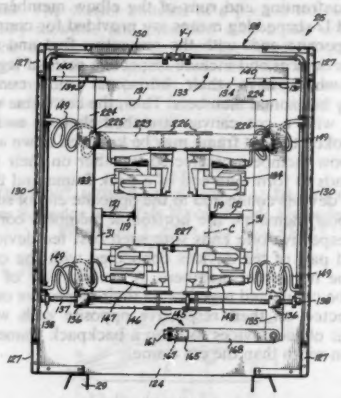
3,620,433
FASTENER DRIVING TOOL
Peter A. Lawton, 83 Park Street, South Yarra, Victoria 3141, Australia
Filed Nov. 19, 1969, Ser. No. 878,085
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 **17 Claims**

A powder-actuated fastening tool having a powder charge receiving member mounted in a housing for movement between a loading position wherein a bore in the powder charge receiving member is in communication with a loading port in the housing and a firing position wherein the bore is in communication with a barrel member having a piston therein, and a firing pin mounted in the housing on the opposite side of said powder charge receiving member from



said barrel and being in alignment with the bore when the powder charge receiving member is in the firing position.

3,620,434
AUTOMATIC CARTON STAPLING MACHINE
Theodore M. Marquis, P.O. Box 1432 512 S. 1st Ave., and John A. Crabb, both of Yakima, Wash.
Filed Apr. 30, 1968, Ser. No. 726,644
Int. Cl. B27f *7/06;* **B65b** *51/05*
U.S. Cl. 227—101 **20 Claims**

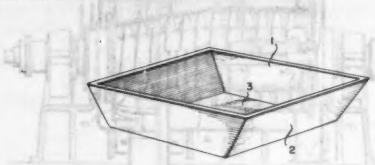


A power driven carton feed unit, a carton discharge unit and a thin stapling unit sandwiched therebetween; the carton being power delivered into the stapling unit which delivery triggers the firing of staples into the carton from two upper and two lower stapling heads, said heads being carried on a frame which is then automatically shifted laterally to a secondary position in which staples are again automatically fired from said heads into said carton. The frame remains in said secondary position for the first firing of staples in the next succeeding carton entering the staple unit and automatically returns to its primary position for the automatic second firing of staples into said succeeding carton.

3,620,435
FOOD PACKAGING CONTAINER COMPRISING MOLDED LAMINATED POLYETHYLENE AND ETHYLENE-VINYLALCOHOL

Hidenobu Sogi, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Sakazu, Kurashiki, Japan

Filed Dec. 22, 1969, Ser. No. 887,436
Claims priority, application Japan, Dec. 24, 1968, 43/95199
Int. Cl. B29c *23/00*; B32b *27/08*; B65d *3/00*
U.S. Cl. 229—3.5 R 2 Claims

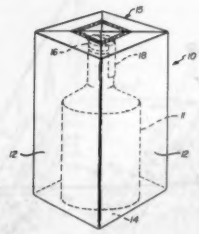


A packaging container for food comprising a molded laminated sheet of (1) ethylene-vinylalcohol copolymer layer, containing 30 to 60 mol percent of ethylene units and the balance of vinylalcohol units, and (2) a polyethylene layer having a melt index of from 0.1 to 10. The container is characterized by substantial gas, especially oxygen in air, and water impermeabilities; and has an opening mouth, sidewalls and bottom with the total area of the sidewalls and the bottom being not more than three times that of the opening mouth.

3,620,436
FOLDING CARTON TOP WITH SEQUENTIAL LOCKING FLAPS

Leonard Adams, Jr., Louisville, Ky., assignor to The Finn Industries Division, Potlatch Forests, Inc., Chicago, Ill.

Filed June 24, 1969, Ser. No. 836,060
Int. Cl. B65d *5/10*
U.S. Cl. 229—39 R 10 Claims



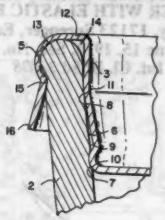
A carton is disclosed with a simulated prewrap or gift wrapping in which the top is closed by means of four flaps which, when completely assembled, are self-locking and self-leveling. The preferred embodiment of the construction is employed with a simulated prewrap or gift wrap which extends in weblike fashion between three of the flaps and is secured to the flaps at a portion between the end of the flap and the junction between the flap and the carton.

3,620,437
CUP AND LID

Robert C. Kulp, Spring City Township, Pa., assignor to The Alan IW Frank Corporation, O'Hara Township, Allegheny County, Pa.

Filed Mar. 6, 1967, Ser. No. 620,762
Int. Cl. B65d *5/64*, *43/00*
U.S. Cl. 229—43 11 Claims

A cup and lid combination comprising a generally frustoconical open-topped cup and a lid having a plug portion to be forced down into the open top of the cup, the plug portion of the lid being shaped to sealingly engage the inside surface of the cup at two zones of the plug portion, one zone adjacent the bottom of the plug portion and another zone intermediate the bottom and top of the plug portion. The surface of the plug portion of the lid at the first zone is rounded to facilitate entry of the plug portion of the lid into the cup and the surface of the plug portion of the lid at the second zone is relatively pointed to enhance its sealing effect. The

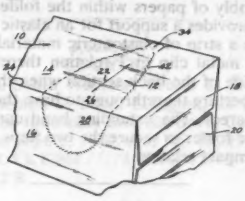


lid has a hood portion receiving the cup rim and the open top of the cup has a slightly outwardly projecting lip which is embraced and sealingly engaged by the hood portion of the lid. The lid is shaped for three-point frictional engagement with other identical lids when nested to form and maintain a stack of lids for shipping and storage.

3,620,438
MEANS TO REDUCE DELAMINATION OF CARTONS HAVING REMOVABLE ACCESS PANELS

Robert E. Wood, and Paul B. Rouse, both of Ashland, Ohio, assignors to A. L. Garber Company, Ashland, Ohio

Filed Apr. 1, 1970, Ser. No. 24,477
Int. Cl. B65d *5/54*
U.S. Cl. 229—51 TS 7 Claims

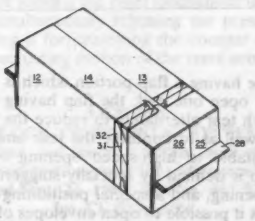


A means to provide a carton with a "tear-out" access panel defined by peripherally spaced perforations so disposed that they permit the panel to be removed without causing delamination of the plies of the material. The perforations are progressively positioned about the periphery of the panel in such a manner that the individual "tears" between adjacent perforations will be directed parallel to the grain of the carton material.

3,620,439
SEVERABLE CARTON WITH STERILE EDGE

Hugh B. Morse, San Jose, and Thomas W. Foster, Palo Alto, both of Calif., assignors to Fibreboard Corporation, San Francisco, Calif.

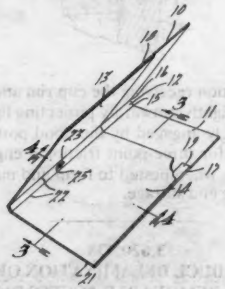
Filed June 13, 1969, Ser. No. 833,008
Int. Cl. B65d *5/54*
U.S. Cl. 229—51 AS 6 Claims



A carton comprises separable sections connected together at a continuous cut line, covered by a removable tape. Means

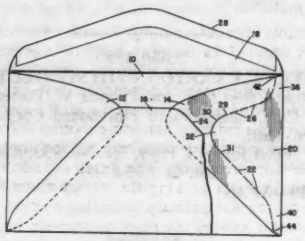
formed on the carton adjacent to the cut line provide a sterile edge around the carton upon removal of the tape and separation of the carton's sections.

3,620,440
FOLDER WITH ELASTIC BAND
Norman J. Humphrey, 17123 Sprenger, East Detroit, Mich.
Filed June 15, 1970, Ser. No. 46,146
Int. Cl. B65d *27/08*
U.S. Cl. 229—72 **5 Claims**



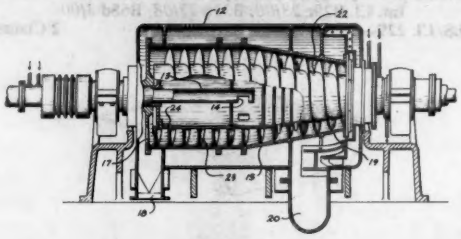
The folder has two flaps extending outwardly from a back section disposed at right angles thereto. The back section permits assembly of papers within the folder without undue bulging and provides a support for an elastic band. The band is made from a strip of elastomeric material having its ends secured to a metal clip in T-relation thereto. The clip engages the inside of the back section when the band is drawn through an aperture therethrough to have the clip engage the inner face thereof. The extending band can be drawn over one end of the folder to secure the two flaps and the contents thereof in compact relation.

3,620,441
ENVELOPE
Daniel T. Robbins, 1415 W. Clark Ave., Burbank, Calif.
Filed Sept. 26, 1969, Ser. No. 861,259
Int. Cl. B65d *27/34, 27/38*
U.S. Cl. 229—85 **2 Claims**



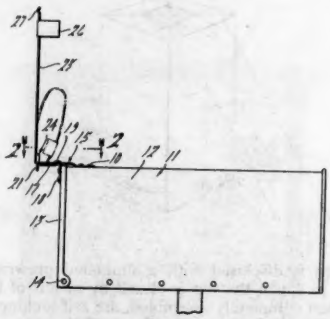
An envelope having a flap portion which is easily stripped to completely open one end, the flap having staggered perforations which tear alternately to reduce the force required to initiate as well as to continue the tear and so being particularly adaptable to high-speed opening by machine. A strippable flap is defined by specially staggered perforations for ease in opening, and a special positioning of the strippable flap makes it possible to open envelopes of different sizes on the same envelope-opening machine frequently without adjustment or only one-half of the adjustment otherwise required.

3,620,442
CENTRIFUGE SLURRY SUPPLY
John J. Halloran, Jr., Lombard, Ill., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Mar. 17, 1969, Ser. No. 807,750
Int. Cl. B04b *1/10*
U.S. Cl. 233—7 **11 Claims**



A centrifuge of the type which has a central slurry feed pipe, a rotating bowl, and a concentric conveyor which includes a tubular shaft with a helix on the outside. The shaft has rectangular openings in the area of the slurry feed with rectangular orifice plates of hardened material fastened inside the shaft. The orifice plate is sealed to the shaft so that it forms a lip, retaining a pool of slurry within the shaft. The orifice plate is also smaller than the opening and overlaps the trailing edge of the opening.

3,620,443
MAILBOX SIGNAL FLAG
David Sturtz, 816 Huron St., Port Huron, Mich., and John R. Moulton, 4187 Fourlake Drive, Linden, Mich.
Filed Jan. 26, 1970, Ser. No. 5,532
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **4 Claims**

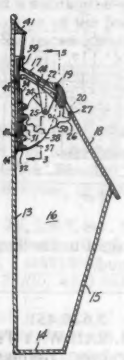


A signal flag is supported on the mailbox in position to have the flag-supporting spring standard bent into a loop when the extending free end is secured in position to be released when the closure door of the container box is opened to indicate that mail has been delivered. When the door is closed, after the delivered mail is removed, the end of the standard is again secured in releasable position.

3,620,444
AUTOMATIC MAILBOX INDICATOR
Harold E. Crozier, 2522 Wrightsboro Road, Augusta, Ga.
Filed Sept. 4, 1970, Ser. No. 69,778
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **10 Claims**

A mailbox having a hinged lid with a letter slot. A weighted toothed wheel has a lug engageable by a letter inserted in the slot. The weighted wheel is rotated past dead center and its teeth elevate a rack bar with an indicator at its

top, which is thus moved upwardly into view. An arm carried



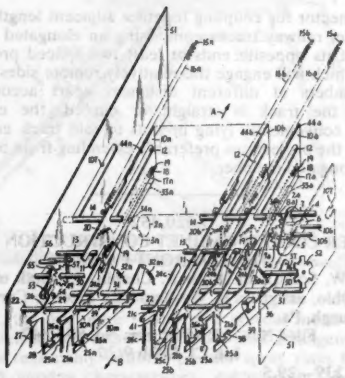
by the lid returns the wheel to normal position and lowers the indicator when the lid is opened.

3,620,445

CALCULATING MECHANISM FOR CALCULATING MACHINE

Toshiki Kawamura, Narashino-shi; Tohru Ohneda, Funabashi-shi; Yasuaki Nomura, Tokyo, and Kikuo Taguchi, Funabashi-shi, all of Japan, assignors to Kabushiki kaisha Hattori Tokeiten, Chuo-ku, Tokyo, Japan

Filed May 13, 1969, Ser. No. 824,231
Claims priority, application Japan, May 18, 1968, 43/33244
May 27, 1968, 43/35627, 43/35628
Int. Cl. G06c *21/04*
U.S. Cl. 235—60.2 **8 Claims**



A calculating mechanism comprising a credit balance transfer means in which the negative or positive symbols of the value memorized in the calculator are inspected, and an add and subtract control linkage for bringing the accumulator gears alternately in mesh with the actuator racks.

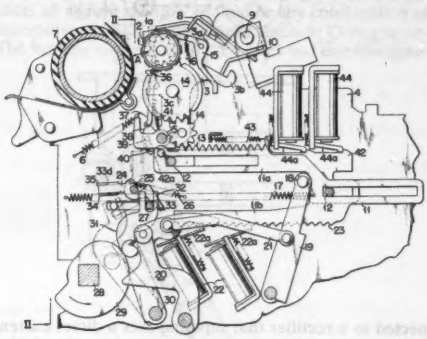
3,620,446

PRINTING DEVICE FOR A CALCULATING MACHINE

Morimasa Mano, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha Mizuho-Ku, Nagoya-shi, Japan

Filed Mar. 17, 1970, Ser. No. 20,216
Claims priority, application Japan, Mar. 18, 1969, 44/20696
Int. Cl. G06c *19/04*; B41j *5/30*
U.S. Cl. 235—60.15 **8 Claims**

A printing device for a calculating machine which comprises mounting a decimal mark carrier for carrying digit types and effecting a printing operation toward a platen, juxtaposing a decimal mark type actuator for setting said decimal mark type at a prescribed printing position with another digit type actuator for positioning required digit types, controlling the movement of both digit type actuators separately by number setting means, providing a sensing means for sensing the position of both actuators for each order, controlling the printing operation of said supporting



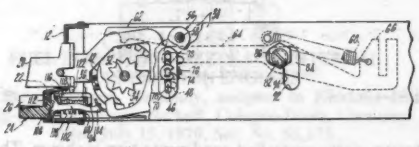
member by the sensing action of said sensing means with mechanism for eliminating zeros, thereby enabling a number including a decimal fraction to be printed by depressing in turn the keys corresponding to the digits and decimal mark involved in said number in the sequence in which said digits and decimal mark are arranged, starting with those representing the higher orders.

3,620,447

COUNTER

Ludwick Szeluga, South Windsor; Ernest G. Hoffman, Middlefield, and Roland S. Sabo, Ellington, all of Conn., assignors to Veeder Industries Inc., Hartford, Conn.

Filed Sept. 8, 1970, Ser. No. 70,217
Int. Cl. G06f *15/18*; G06c *15/42*
U.S. Cl. 235—132 R **9 Claims**



A resettable predetermining counter having a preset mechanism adapted for being moved into a preset-conditioning position in engagement with the counter wheels and a withdrawn preset-prohibiting position out of engagement with the counter wheels is provided with a dual-motion reset actuator having a primary actuating motion for resetting the counter and a secondary actuating motion for conditioning the counter for presetting. The reset actuator is provided with an interlock for locking the preset mechanism against presetting during the primary actuating motion of the reset actuator and for locking the reset mechanism in its reset condition while simultaneously releasing the preset mechanism and conditioning it for presetting the counter wheels during the secondary actuating motion of the reset actuator.

3,620,448

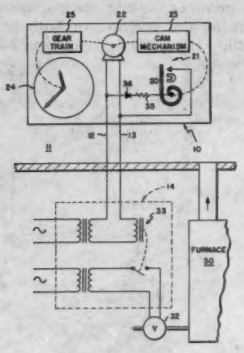
CLOCK-THERMOSTAT SYSTEM

Clifford L. Nelson, and David J. Sutton, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 25, 1969, Ser. No. 861,023
Int. Cl. F23n *5/20*
U.S. Cl. 236—46 **4 Claims**

A clock-thermostat system in which the thermostat located in the controlled space is connected to the furnace and a

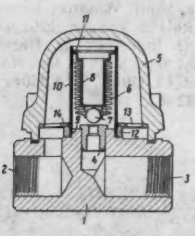
power supply by two wires which energize the synchronous clock motor as well as transmit information as to whether the thermostat is calling for heat. The thermostatic switch is connected to a rectifier that superimposes a direct current component on the alternating current supply to the clock motor, which component is sensed by control apparatus at the furnace.



3,620,449
THERMALLY CONTROLLED CONDENSATE TRAP

Gerhard Hohn, 28 Bremen, Probststrasse 1, and Josef Lingnau, 28 Bremen-Borgfeld, Brandenweg 2, both of Germany

Filed Feb. 26, 1970, Ser. No. 14,817
Int. Cl. F16t *1/10*
U.S. Cl. 236—56 **6 Claims**



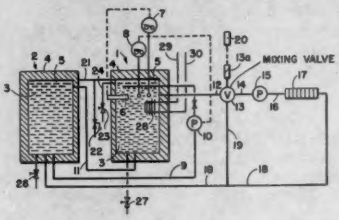
A thermally controlled condensate trap is shown. The trap includes a housing having cover means secured thereto and inlet and outlet openings therewithin. A sludge strainer is disposed within the housing and bears cutoff valve means which are controlled by temperature sensing means.

3,620,450
ELECTRICALLY HEATED CENTRAL HOT WATER HEATING SYSTEM

Paul Leuenberger, Bern, Switzerland

Filed Oct. 15, 1969, Ser. No. 866,553
Claims priority, application Switzerland, Oct. 21, 1968, 15682/68
Int. Cl. F24d *3/02, 3/10*
U.S. Cl. 237—8 **12 Claims**

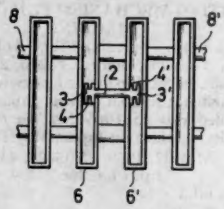
An electrically heated central hot water system includes at least two separate interconnected vessels providing a series arranged heated storage water column. The heating means for the water is located within only one vessel with the interconnection of the vessels being arranged for withdrawing water from the lower zone of the unheated vessel and charging it into the upper zone of the other vessel where the heating means are located. In this manner, the water in both vessels is heated to a desired level. The heated water is used to heat room convectors directly or to heat another source of water which circulates through the room convectors. In providing heat for the convectors the heated water from the unheated vessel is returned to the heated vessel so that its stored heat may be utilized.



3,620,451
MODEL RAILWAY TRACK

Wolfgang Richter, Nurnberg, Germany, assignor to Ernst Paul Lehmann, Nurnberg, Germany

Filed Apr. 24, 1969, Ser. No. 818,886
Claims priority, application Germany, May 30, 1968, L 47 544.77
Int. Cl. A63h *19/30*
U.S. Cl. 238—10 E **4 Claims**



A connector for coupling together adjacent lengths of toy and model railway tracks comprising an elongated member having at its opposite ends at least two spaced projections one of which will engage the relatively remote sides of track end members at different distances apart according to whether the track is straight or curved, the elongated member conveniently lying in slots in said track end members and the projections preferably extending from both sides of the elongated member.

3,620,452
WATER COOLER CABINET CONSTRUCTION WITH TILTED FRONT PANEL

Eugene W. Scott, and Roger F. Chapin, Jr., both of Columbus, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1969, Ser. No. 875,347
Int. Cl. E03b *9/20*
U.S. Cl. 239—29.5 **4 Claims**

A floor-supported water cooler cabinet of the type having a toe pedal is constructed with the front edge of the toe pedal

being substantially flush with the front edge of the cabinet sidewalls, and the front panel for the cabinet is tilted inwardly through at least a substantial part of its lower portion so that the exposed portion of the foot pedal is easily viewable and contacted by the user without projecting beyond the basic confines of the cabinet.

3,620,453

SHAPED ARTICLE WITH INSECTICIDAL PROPERTIES

Abraam Gancberg, 31, rue Andre Baillon, Forest; Raymond Carpentier, 19, avenue Blucher, Waterloo, and Rene Paquet, 251, rue d'Horrues, Braine-le-Comte, all of Belgium

Filed Sept. 24, 1969, Ser. No. 860,829
Claims priority, application Belgium, Sept. 26, 1968, 45818/68
Int. Cl. A24f *25/00;* **A61l** *9/04;* **A01m** *1/20*
U.S. Cl. 239—60 **12 Claims**

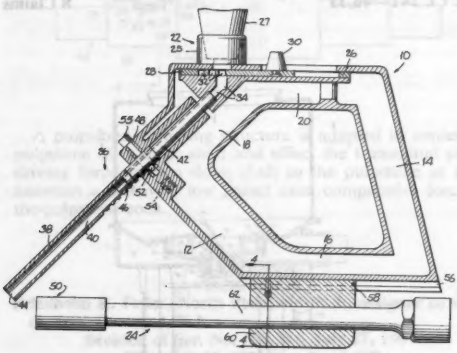
A shaped article with insecticidal properties, which comprises a solid porous mineral support, agglomerated naturally or artificially, which is impregnated with at least one insecticidal substance, the mineral support being inert with regard to the insecticidal substance under the conditions under which the article is used for combatting insects.

3,620,454

FLAME SPRAY TORCH

John P. Broderick, Bellerose; Frederick T. Wishnie, Seaford, and Don L. Keys, Huntington, all of N.Y., assignors to Eutectic Corporation, New York, N.Y.

Filed Jan. 31, 1968, Ser. No. 702,035
Int. Cl. B44d *5/00*
U.S. Cl. 239—79 **6 Claims**



Briefly, the disclosure relates to a powder metal-spraying torch which utilizes a gravity powder feed arrangement that maintains reasonably uniform powder spray rates for powders with varying characteristics. Additionally, the metal-spraying torch is arranged to control the spray pattern shape and density as well as the relationship of the fed powder to the flame.

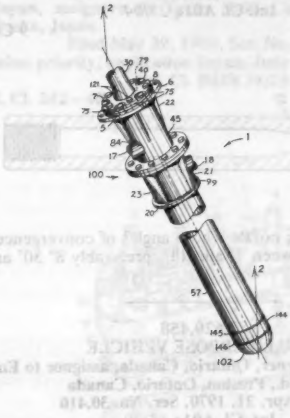
3,620,455

EASILY REPAIRABLE GAS INJECTION LANCE

William W. Berry, Pittsburgh, Pa., assignor to Berry Metal Company, Harmony, Pa.

Continuation-in-part of application Ser. No. 770,968, Oct. 28, 1968, now abandoned. This application June 10, 1970, Ser. No. 44,931
Int. Cl. B05b *15/00*
U.S. Cl. 239—132.3 **21 Claims**

A gas lance for oxygen or for a mixture of oxygen and fuel, including a lance top adapter assembly, a nozzle head and three or four concentrically positioned pipes wherein mixing of the oxygen and any other fluids are prevented, except that where fuel fluid is used, the oxygen and fuel fluids are mixed in the nozzle ejection chambers, and wherein there is included, in the lance top adapter assembly, safety means for venting to the atmosphere any leaking oxygen and oxygen-containing mixtures. The lance top adapter assembly includes the combination of a bushing member, a piston sleeve and a bushing sleeve and also includes means for sealing the piston sleeve and the bushing member, means for sealing the bushing sleeve and the piston sleeve, and means for sealing the bushing sleeve and quick disconnect means for quickly and easily removing the lance top adapter assembly from the oxygen lance, all against the flow of fluid or any combination of fluids therebetween. Said sealing means include O-ring structures. The bushing sleeve is easily removed and interchangeable and can be easily removed and replaced or repaired when any scoring occurs in any slip joint or sealing means. The structure is such that oxygen and any other fluid cannot be mixed within the lance proper for the reason that any other fluid, should there be leakage thereof, will first pass to the atmosphere at negative pressure before it will flow into the oxygen channels under positive pressure and also for the reason that the oxygen, should there be leakage thereof, will first pass to the atmosphere at negative pressure before it will pass into any other fluid within the lance proper under positive pressure.

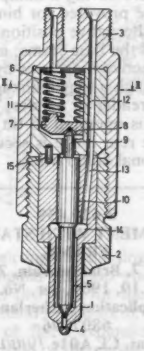


3,620,456

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Josef Berg, Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Filed July 15, 1970, Ser. No. 55,173
Claims priority, application Germany, July 23, 1969, P 19 37 419.7
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **4 Claims**



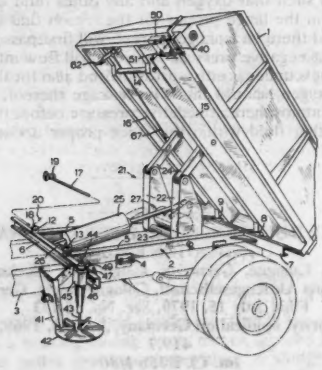
An injection nozzle for fuel injection engines with a nozzle needle acted upon by a plurality of springs, in which the

resultant of the spring forces is conveyed through a universally journaled spring dish upon the nozzle needle the axis of which is in substantially axial alignment with said resultant.

3,620,457
CUTTING NOZZLE
Clive Leonard Pearson, Uxbridge, England, assignor to The British Petroleum Company Limited, London, England
Filed Nov. 14, 1969, Ser. No. 876,946
Claims priority, application Great Britain, Dec. 3, 1968, 57,250/68
Int. Cl. A01q *25/04*
U.S. Cl. 239—589 **9 Claims**

A venturi cutting nozzle whose angles of convergence and divergence are between 7° and 11°, preferably 8° 30′ and 9° 30′.

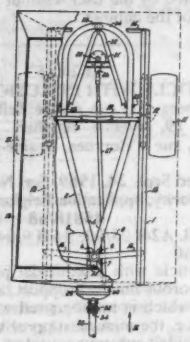
3,620,458
DUAL-PURPOSE VEHICLE
Albert Rath, Kitchener, Ontario, Canada, assignor to Eastern Steel Products Ltd., Preston, Ontario, Canada
Filed Apr. 21, 1970, Ser. No. 30,410
Int. Cl. A01c *17/00*
U.S. Cl. 239—657 **7 Claims**



A dual-purpose vehicle for use as a spreader and as a dump truck, the vehicle having a dump body mounted on a base frame, means are provided for hinging the dump body to the base frame at alternative positions adjacent to the forward and rear ends of the base frame, and the dump body is raised about the respective hinge axis by means of a hydraulic ram operating through a toggle linkage. When the vehicle is to be used as a spreader or sander, the forward hinge is secured and the ram is operated to tilt the dump body forwards. When only the rear hinge is secured, the vehicle can be used as a conventional dump truck.

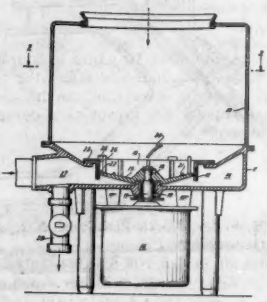
3,620,459
SPREADING IMPLEMENT WITH STABILIZED SUPPORT FRAME
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed May 19, 1969, Ser. No. 825,502
Claims priority, application Netherlands, May 20, 1968, 6807096
Int. Cl. A01c *19/00*
U.S. Cl. 239—670 **8 Claims**

A spreader implement with an elongated container mounted on a frame is supported on three support points in the form of two rear, spaced-apart ground wheels and a pair of closely adjacent front ground wheels. As seen in plan, all



of the wheels are located beneath the container to insure stability when the container is fully loaded.

3,620,460
WASTE-PULPING MACHINE WITH SHEAR AND INTERRUPTER MEMBERS
Robert W. Hankes, Downingtown, Pa., assignor to Somat Corporation, Pomeroy, Pa.
Filed July 20, 1970, Ser. No. 56,469
Int. Cl. B02c *13/14*
U.S. Cl. 241—46.11 **8 Claims**

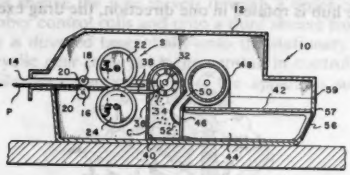


A waste-pulping machine of the type utilizing a rotating impeller in which the impeller is provided with one or more blades which can cooperate with one or more stationary blades to provide a shearing action. Interrupter members having cutting edges which will also engage with the blades on the impeller are mounted in stationary position on said machine to facilitate the loosening, cutting and removal of fibrous material in the machine.

3,620,461
PORTABLE SHREDDER FOR CLASSIFIED DOCUMENTS
Joe Pelleschi, and Charles A. Pelleschi, both of Box 54, Spangler, Pa.
Filed Feb. 11, 1970, Ser. No. 10,415
Int. Cl. B02c *9/04*
U.S. Cl. 241—100 **17 Claims**

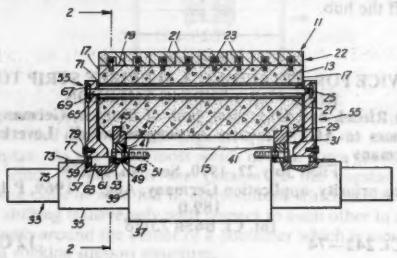
A portable shredder for classified documents including a housing, a pair of cooperating shearing rolls each having a plurality of substantially parallel cutting edges, means for feeding sheet material to said shearing rolls, a rotary blade cutter spaced from and substantially parallel to said shearing

rolls, means for receiving shredded material, airflow means for forcing said shredded material into said receiving means,



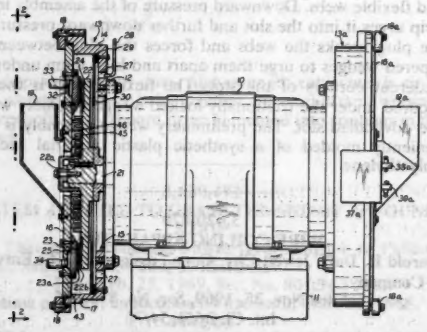
and means for driving said shearing rolls, said feeding means, said rotary blade cutter, and said airflow means.

3,620,462
PULPSTONE MOUNTING
Peter C. Dooley, Jr., Lewiston, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed June 12, 1970, Ser. No. 45,682
Int. Cl. B02c *4/30*
U.S. Cl. 241—294 **10 Claims**



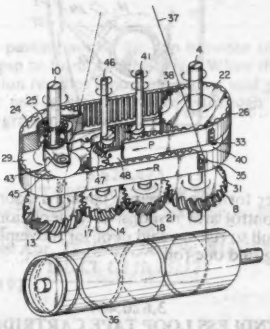
A pulpstone mounting structure is adapted to center the pulpstone on a drive shaft and effect the transmittal or the driving force from a drive shaft to the pulpstone so as to maintain a relatively low preset axial compressive force on the pulpstone ends.

3,620,463
DISC MILL
Friedhelm R. Feder, North Plainfield, N.J., assignor to Wedco, Inc., Garwood, N.J.
Division of Ser. No. 656,384, July 27, 1967
Filed Jan. 28, 1970, Ser. No. 6,608
Int. Cl. B02c *7/06*
U.S. Cl. 241—255 **10 Claims**



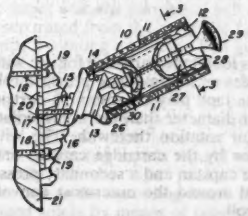
A disc mill having axially spaced cooperating discs, one of which is rotatably mounted on a drive shaft. Each disc has a contoured working surface adjacent the periphery thereof. One of the working surfaces is inclined toward the other disc in a radially outward direction, while the other working surface is perpendicular to the shaft and has an outer periphery disposed outwardly of the periphery of the inclined working surface.

3,620,464
TRAVERSING MECHANISM IN USE FOR FAST YARN WINDING
Shizuma Ueda, and Shigenobu Fujimoto, both of Iwakuni-shi, Japan, assignors to Teijin Seiki Co., Ltd., Higashi-ku, Osaka, Japan
Filed May 29, 1969, Ser. No. 829,032
Claims priority, application Japan, June 13, 1968, 43/40818
Int. Cl. B65h *54/28*
U.S. Cl. 242—43 **4 Claims**



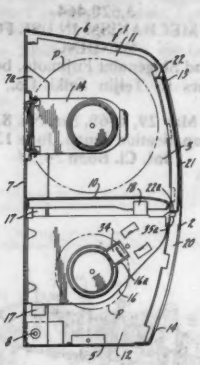
This invention relates to a traversing mechanism for fast yarn winding in packages or the like. In a mechanism for imparting traversing motions to yarn with a plurality of adjacent endless belts passing around two or more pulleys and running opposite to each other in the same plane, this invention is in carrying out the delivery of fibers by thread guides mounted on said belts and with guide disks disposed between the belt adjacent to each other thereby to reverse the yarn-advancing direction.

3,620,465
TOILET PAPER HOLDER
Jethro T. Wyatt, 25813 Seaver St., Hayward, Calif., and Gerald E. Litzinger, 111 Sharon Court, Los Gatos, Calif.
Filed Dec. 1, 1969, Ser. No. 881,196
Int. Cl. B65h *19/00*
U.S. Cl. 242—55.2 **5 Claims**



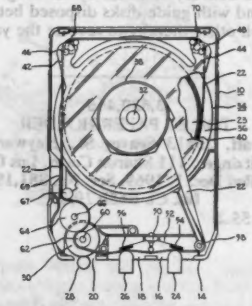
A device for supporting and holding a roll of paper such as toilet paper in an angular position which permits slip off and on roll changes and provides for the paper to be uncoiled therefrom with one hand in pad form. This device is provided with an adjustable or fixed expansion-type mandrel which may be expanded inside of the cardboard tube on which the roll of paper is wound so that the proper amount of friction is applied to the roll of paper to control rotation and paper removal.

3,620,466
ROLL PAPER DISPENSER
Edward L. Bump, Oak Park, Ill., assignor to Vaughan Mfg. Co., Chicago, Ill.
Filed Sept. 10, 1969, Ser. No. 856,589
Int. Cl. A47k *10/22, 10/38;* **B65h** *19/04*
U.S. Cl. 242—55.3 **3 Claims**



A dispenser for rolls of paper having a door covering one roll and a control arm responsive to depletion of the paper on another roll to release said door for movement into a position exposing said one roll.

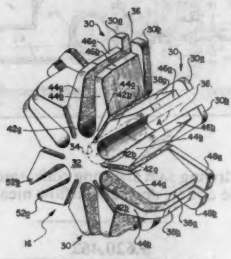
3,620,467
ENDLESS LOOP TAPE CARTRIDGE
Warren Rex Isom, Indianapolis, Ind., assignor to RCA Corporation
Filed Sept. 3, 1969, Ser. No. 855,003
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A **2 Claims**



An endless loop tape cartridge for use with a cartridge tape player includes an intermediate pressure roller adapted to be driven by the tape player capstan. A cartridge capstan, having a smaller diameter than the intermediate pressure roller, is secured for rotation therewith. The withdrawn cartridge tape is driven by the cartridge capstan and passes between the cartridge capstan and a secondary pressure roller prior to being wound around the outermost convolution of the cartridge tape roll.

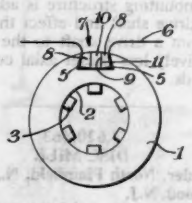
3,620,468
TAPE TRANSPORT HUB
Joseph St. Amour, Acton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Nov. 20, 1969, Ser. No. 878,349
Int. Cl. B65h *75/02, 75/24*
U.S. Cl. 242—68.3 **7 Claims**

A hub for mounting a reel of magnetic tape on a tape transport is composed of a plurality of generally radially extending fingers distributed around the hub axis. Each finger is composed of a pair of flexible, resilient segments which are turned toward one another. The tape reel is in the form of an annulus which is placed on the hub so that the fingers engage the inner wall of the reel.
When the hub is rotated in one direction, the drag exerted by



the reel on the fingers causes one segment in each finger to straighten out so that the tip of that segment tends to move further away from the hub axis into nonslip engagement with the reel. When the hub is rotated in the other direction, the other segment in each finger grips the reel in like manner. However, when the hub is stopped, the reel is easily slid onto and off the hub.

3,620,469
DEVICE FOR ATTACHING A FLEXIBLE STRIP TO A REEL FOR WINDING THEREON
Anton Riedel, and Max Nissl, both of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed July 22, 1970, Ser. No. 57,199
Claims priority, application Germany, Aug. 1, 1969, P 19 39 189.0
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **12 Claims**

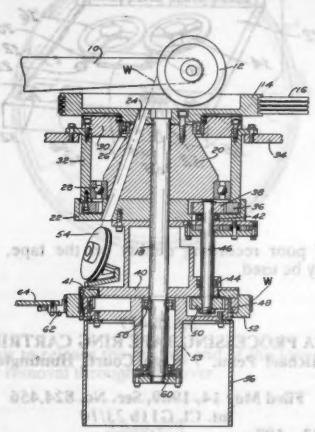


A device for attaching a flexible strip to a reel includes a wedge assembly and a dovetailed slot in the hub of the reel. The preliminary wedge assembly includes a central plug attached cornerwise to a pair of spaced wedges by frangible and flexible webs. Downward pressure of the assembly in the strip urges it into the slot and further downward pressure on the plug breaks the webs and forces the plug between the tapered wedges to urge them apart and lock them under the undercut corners of the slot. The flexible strip is thereby secured under the frictionally locked wedge assembly within the dovetailed slot. The preliminary wedge assembly is conveniently molded of a synthetic plastic material such as polyethylene.

3,620,470
WIRE COILING APPARATUS
Harold H. Duff, Jewett City, Conn., assignor to The Entwistle Company
Filed Nov. 25, 1969, Ser. No. 879,855
Int. Cl. B65h *54/76*
U.S. Cl. 242—82 **4 Claims**

A wire coiler which brings the wire into the apparatus over a sheave mounted vertically atop the apparatus and im-

mediately directs the wire downwardly at an acute angle to the vertical toward the outside perimeter of the stationary capstan where it travels around a second sheave. Exiting from this sheave the wire travels through a series of casting and camber control rolls and onto a third sheave from which the wire is directed tangentially onto the stationary capstan. An epicyclic gear train holds the capstan in controlled position while the upper structure of the apparatus supporting

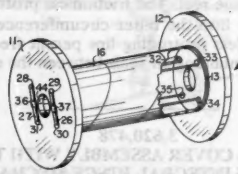


the second sheave, the casting and camber control rollers, and the third sheave rotate to place the wire on the stationary capstan. As the uppermost winds of wire force the lowermost winds of wire off the bottom of the capstan, the dropping coils of wire fall in convolutions which are successively shifting transversely with respect to each other in a circular path around the center of a container which is mounted upon a rocking support structure.

3,620,471
CABLE REEL

Ronald R. Hubbard, and Klaus H. Blumenfeld, both of Orange, Calif., assignors to Anaconda Wire and Cable Company

Filed Nov. 21, 1969, Ser. No. 878,734
Int. Cl. B65h *75/14*
U.S. Cl. 242—118.6 **6 Claims**



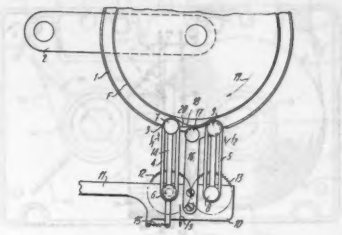
A disposable heavy-duty, high-strength cable reel is made with wooden flanges held together by steel straps within a waterproofed paperboard drum cemented into routings in the flanges.

3,620,472
SYSTEM ADAPTED TO GRASP THE END OF A WOUND STRIP

Jean Thevenaz, Grandson, Switzerland, assignor to Paillard S.A., Sainte-Crois, Vaud, Switzerland

Filed Feb. 25, 1969, Ser. No. 801,943
Claims priority, application Switzerland, Mar. 20, 1968, 4142/68
Int. Cl. G11b *15/66, 15/32*
U.S. Cl. 242—192 **4 Claims**

The system is adapted to grasp the end of the outer convolution of a wound film, tape or the like strip. To this end it resorts to one or preferably two movable, spaced-apart members such as belts or pulleys engaging the periphery of the wound strip so that the relative difference in speed between the two members at their portions engaging said periphery

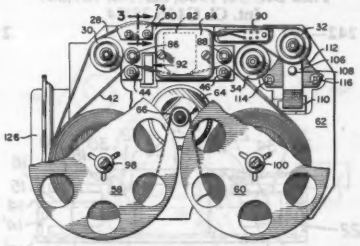


urges the strip passing across the gap between the two members into said gap to form a slight bulge. When the end of the outer convolution reaches a position facing said gap, it passes over the bulge and is urged outwardly through the gap and away from the grasping system.

3,620,473
TAPE TRANSPORTS

Robert L. Stone, Portland, Conn., assignor to Raymond Engineering, Inc., Middletown, Conn.

Filed Apr. 11, 1969, Ser. No. 815,359
Int. Cl. G11b *15/32*
U.S. Cl. 242—192 **11 Claims**



A peripheral belt tape transport employs a single capstan driving the peripheral belt. The peripheral belt is maintained in contact with the outer layers of magnetic tape on a pair of tape packs. A brake acts on the peripheral belt on the opposite side of the tape packs from the driving capstan. In the preferred embodiment, the brake takes the form of a solid graphite shoe in contact with the peripheral belt at a position where the belt is separated from the magnetic tape. In alternative embodiments, a rotating peripheral belt guide drives a mechanical, viscous, magnetic, or eddy current brake, or a loaded generator, which subtracts energy from the peripheral belt. The operating temperature range of the peripheral belt drive is greatly enhanced by not rigidly adhering the inner ends of the tape to the tape pack hubs and by the use of lubricated tape. The lubricated tape is wound with its oxide side facing outwardly on the tape packs. The tape is separated from the belt at the recording head. Head to tape contact is maintained solely by means of tape tension. Conventional flanged reels support the tape packs.

3,620,474
SELF-LOADING TAKEUP REEL

Robert C. Ray, North Hollywood, Calif., assignor to Bell & Howell Company, Chicago, Ill.

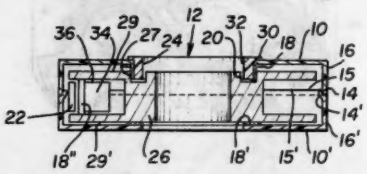
Filed Apr. 10, 1969, Ser. No. 814,973
Int. Cl. G11b *15/66;* **B65h** *75/28*
U.S. Cl. 242—195 **14 Claims**

A self-loading takeup reel for use in a tape transport which is provided with a supply tape having a relatively stiff leader

wider than the tape attached to one end. The reel has a flexible flange attached to one side of the hub which resiliently

biases the leader against a preferably rigid flange when the leader is received between the flanges.

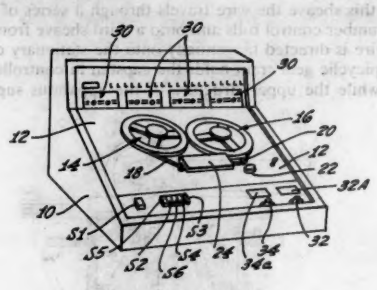
3,620,475
DATA PROCESSING MAGNETIC TAPE CARTRIDGE
Edward Michael Penn, 7 Rego Court, Huntington Station, N.Y.
Filed Dec. 30, 1968, Ser. No. 787,807
Int. Cl. G11b *23/04*
U.S. Cl. 242—197 **2 Claims**



A disk-type case for a reel of magnetic tape is formed with two mating disk sections which may be snap fitted together. The sections have an unobstructed central aperture area in which the hub of a tape reel is exposed so that the reel may be rotated while in said casing. A peripheral slot having an adjustable closure is provided in the case for tape entry and exit. Frictionless gaskets in the sections of the case permit rotation of the reel while maintaining air seals at the central apertured area.

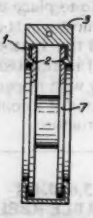
3,620,476
CASSETTE DUPLICATOR
Felipe Cervantes, La Crescenta, Calif., assignor to Infonics, Inc., Santa Monica, Calif.
Filed Apr. 14, 1969, Ser. No. 815,584
Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*
U.S. Cl. 242—197 **12 Claims**

A high-speed inexpensive magnetic tape duplicator is provided which is capable, for example, of duplicating a program recorded on a master magnetic tape simultaneously on a plurality of cassette-type magnetic tape cartridges preloaded with magnetic tape, and the like. The apparatus of the invention is controlled so that all tapes quickly come up to speed in order that maximum use may be made of all the tapes in the various cassettes. This minimizes the beginning



portion of poor recording quality on the tape, and short leaders may be used.

3,620,477
DATA PROCESSING TAPE RING CARTRIDGE
Edward Michael Penn, 7 Rego Court, Huntington Station, N.Y.
Filed May 14, 1969, Ser. No. 824,456
Int. Cl. G11b *23/10*
U.S. Cl. 242—197 **2 Claims**

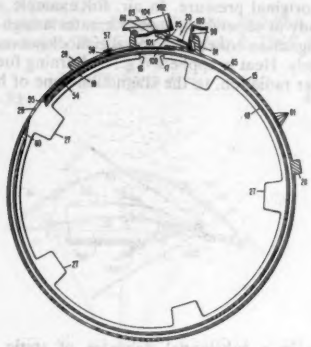


This invention relates to a protective ring cartridge for magnetic tape reels which does not interfere with the normal use of said reel in a machine. The cartridge is comprised of a flexible ring with protruding frictionless lips which permit its attachment to a tape reel. The frictionless protruding lips fit into a groove cut into the outer circumference of the tape reel. The frictionless protruding lips permit free rotation of the reel while maintaining air seals between the cartridge and the tape reel.

3,620,478
TAPE REEL COVER ASSEMBLY WITH THREE-POSITION INTEGRAL HINGE MECHANISM
Richard J. Fitzgerald, Hygiene; Ronald R. Jacobsen, Golden, and William J. Rueger, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,085
Int. Cl. G11b *23/02, 15/66*
U.S. Cl. 242—197 **15 Claims**

A protective reel cover assembly has a three-position, toggle action, unitary hinge interconnecting the split end portions of a closure ring for a magnetic tape reel cartridge of the type adapted to be mounted for rotation on a tape deck. The hinge body is comprised of three parts hingedly interconnected and being movable to positively lock the cover in a closed position for storage of the cartridge and either one of two open positions in which the cover is expanded to a sufficient extent either to permit independent rotation of the tape reel cartridge or to permit removal or replacement of the tape reel. The cover comprises inner and outer closure

ring portions with the inner ring portion snap-fit within the outer ring portion to define an air chamber for the controlled



delivery of air to release the leading end of the tape from the tape reel for removal through the cover.

3,620,479

TAPE CARTRIDGE LOADING DEVICE

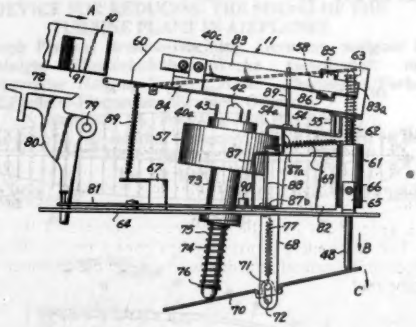
Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Kanagawa-ken, Japan

Filed June 9, 1970, Ser. No. 44,708

Claims priority, application Japan, June 10, 1969, 44/45018
July 10, 1969, 44/54070

Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*

U.S. Cl. 242—198 **9 Claims**



A tape cartridge loading device for loading and removing a tape cartridge in and from a chassis of a cartridge type recording and reproducing apparatus. Upon complete insertion of the cartridge into the chassis, a reel shaft is moved upwardly and fits into the cartridge. Upon withdrawal of the reel shaft from the cartridge, the cartridge is released from a locked position where it is ready for removal from the chassis.

3,620,480

LOW-FRICTION MAGNETIC TAPE CARTRIDGE

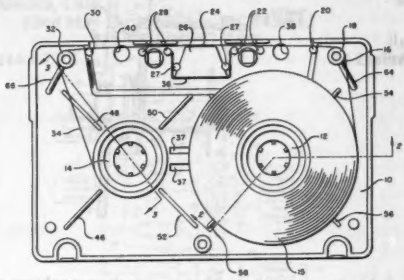
Austin A. Knox, White Plains, N.Y., assignor to Dict-O-Tape Inc., Brooklyn, N.Y.

Filed May 1, 1968, Ser. No. 725,696

Int. Cl. G11b *23/10*

U.S. Cl. 242—199 **7 Claims**

A magnetic recording tape cartridge (FIG. 2) having a tape hub 12 which supports a roll of magnetic tape **15** in



spaced relation to the inside surfaces of the cartridge casing **10.**

3,620,481

WEB TRANSPORT SYSTEMS

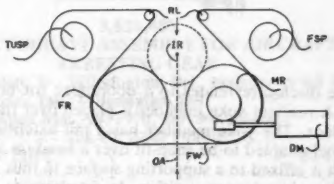
David John Stewart, 52 Oakland Drive, Wokingham/Berkshire, England

Filed May 21, 1968, Ser. No. 730,805

Claims priority, application Great Britain, May 23, 1967, 23,956/67

Int. Cl. B11b *15/32;* **G03b** *1/04*

U.S. Cl. 242—203 **2 Claims**



A web of photographic film or the like is stretched between two spools. A constant torque is applied to the spools in senses such that the web between the spools is placed in tension. Between the spools the web is wrapped about and engages part of the periphery of a drum. The drum is driven by a step-by-step motor through a worm gear transmission.

3,620,482

SEPARATOR FOR UNPROCESSED WIRE IN REELING AND WINDING APPARATUS

Ben Bravin, New York, N.Y., assignor to General Cable Corporation, New York, N.Y.

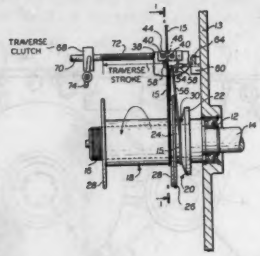
Filed Sept. 8, 1969, Ser. No. 855,988

Int. Cl. B65h *54/02*

U.S. Cl. 242—25 A **10 Claims**

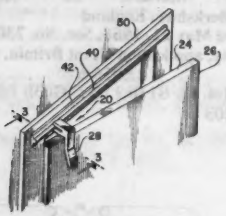
When starting the winding of wire on a reel, the unprocessed, damaged, or unuseable end portion of a long wire is wrapped around an auxiliary reel or dummy reel adjacent to the main reel and as the reel and dummy rotate, the wrapping wire is wrapped first on the dummy and then shifted to continue its winding on the main reel. A pushoff device operated from a wire guide of the traverse of the winding machine releases a loop of wire as the transfer is

made from the dummy to the reel. The pushoff, being at the traverse speed, is slow and the loop makes the apparatus



suitable for use with any existing reeling machines and does not require a slack accumulator.

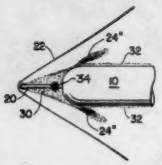
3,620,483
DOORCHECK
Morris Weinberger, 387 Amsterdam Ave., New York, N.Y.
Filed June 1, 1970, Ser. No. 41,927
Int. Cl. E05c *17/04, 19/18*
U.S. Cl. 292—262 **8 Claims**



The disclosure relates to a doorcheck for holding a door ajar. A resilient yoke member is placed over the top edge of the door. The yoke member has a tail extension defining a channel adapted to be snap-fit over a bead on a rail member which is affixed to a supporting surface to thus rigidly secure the door in an open position. In an alternate embodiment, the yoke member is provided with a tail extension and cooperating apertured clamp plate which clamps to a portion of the doorframe. Another embodiment includes a resilient latching arrangement wherein a tail extension of the yoke member includes an upstanding hook member adapted to be accommodated by a receiving latch member affixed to a supporting surface. A further embodiment encompasses a yoke member pivotally mounted to a supporting surface and adapted to be lowered onto the top edge of the door to hold the door in an open position.

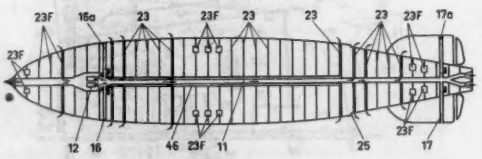
3,620,484
METHOD AND STRUCTURE FOR REDUCTION OF SHOCK WAVES
Fritz Schoppe, Max-Ruttgers-Str. 24, 8026 Ebenhausen/Isartal, Munich, Germany
Filed Jan. 17, 1969, Ser. No. 792,006
Claims priority, application Austria, Feb. 14, 1968, A 1405/68
Int. Cl. B64c *23/04*
U.S. Cl. 244—1 N **8 Claims**

A method of and apparatus for reducing shock waves created by solid bodies having supersonic speed relative to a gas, and reducing and even eliminating the sonic boom which accompanies the shock waves. The nose or leading portion of the moving body, be it a body of revolution, or an airfoil lifting body, or be it another moving body, is provided with blunt configuration at its leading portion to create a detached "normal" shock wave. A three-step thermodynamic cycle is applied to the gas (i.e., air) flow surrounding the moving body. The three steps are (1) compression of the gas, caused by the moving body, (2) heating of the compressed gas by addition of heat, and (3) expansion of the compressed gas to hear its original pressure. In air, for example, a blunt nose flying body at supersonic speeds creates a high compression zone (stagnation zone) between the shock wave and the nose of the body. Heat is applied, e.g., by burning fuel, electricity, or nuclear radiation, to the stagnation zone of high pressure,



resulting in a substantial decrease of static pressure immediately in front of the blunt nose. The heat can be applied to the compressed air zone from forwardly projecting structures suitably shaped to create only low intensity shock waves. The applied heat decreases the static pressure at the nose zone, in turn decreasing the high air drag, and also decreasing the intensity of the shock wave ahead of the flying body, thereby decreasing the intensity of the part of the shock wave which reaches the ground, resulting in a reduction in sonic boom.

3,620,485
DIRIGIBLE
Egon Gelhard, Mehlemer Strasse 28, 5 Cologne-Marienburg, Germany
Filed Oct. 31, 1968, Ser. No. 772,272
Claims priority, application Germany, Oct. 31, 1967, P 15 31 351.6
Int. Cl. B64b *1/06*
U.S. Cl. 244—29 **15 Claims**



A lighter-than-air aircraft having a central passageway longitudinal of the aircraft and a plurality of passageways radiating laterally therefrom. Suitable air moving means are located in said passageways near the forward end of the aircraft for drawing air into said passageways through the forward end thereof and supplying same under pressure to the rearward portion of said central passageway and to said radiating passageways. Suitable independently operated valving means on all of said passageways permit opening and closing of said selected ones thereof whereby said aircraft may be caused to move forwardly or stand still and may be further caused to move upwardly, downwardly or sidewardly. Reversing of said air moving means moves said aircraft rearwardly. Lifting gas is provided in a plurality of independent compartments, same being divided by a flexible diaphragm with lifting gas in one portion thereof and air in the other portion. By varying the proportion of air and lifting gas in selected ones or all of said compartments, the lift of the aircraft may be suitably adjusted or same may be trimmed.

3,620,486

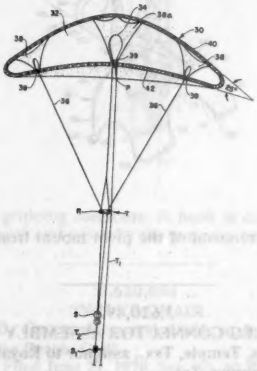
AUTOSTABLE CIRCULAR TETHERED WING BALLOON

Jean F. Charpentier, Akron, and Robert S. Ross, Northfield Center, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Continuation-in-part of application Ser. No. 702,866, Feb. 5, 1968, now abandoned. This application July 9, 1969, Ser. No. 843,282

Int. Cl. B64b *1/50*

U.S. Cl. 244—33 4 Claims



This invention relates to an axisymmetrical-shaped, tethered wing balloon which is substantially autostable in the wind field and, particularly, to a wing balloon which, without performing any rotational motion, is able to keep relatively to the wind direction, a permanent consistent attitude irrespective of changes in wind velocity.

3,620,487

DEVICE FOR REDUCING THE SOUND OF THE TURBINE PLANT IN AIRPLANES

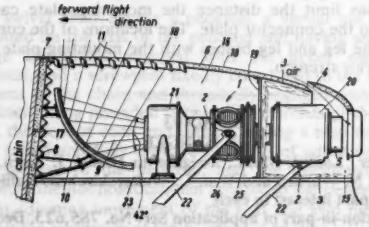
Christoph Fischer, Bremen-Huchting, Germany, assignor to Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher "Weser" Flugzeubau/Focke-Wulf/Heinkel-Flugzeubau, Bremen, Germany

Filed Sept. 26, 1969, Ser. No. 861,305

Claims priority, application Germany, Oct. 3, 1968, P 18 00 933.1

Int. Cl. B64d *1/27*

U.S. Cl. 244—55 14 Claims



An arrangement for reducing the transmission of sound from the drive plant of an air vehicle to the cabin thereof, according to which the drive plant compartment is subdivided into a first section with the compressors and a second section with the turbine means and the exhaust gas outlet, and in which the primarily low-frequency sound created in said second section is directed in a direction away from the air vehicle cabin, whereas the primarily high-frequency sound created in said first section is directed in forward flight direction of the air vehicle and is deviated by a sound deflector and discharged outwardly away from the cabin.

3,620,488

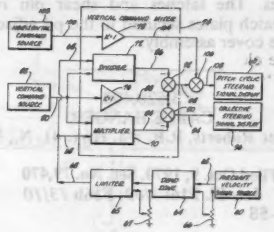
AIRCRAFT COMMAND MIXING DEVICE

Justin G. Miller, deceased, late of Los Angeles, Calif. (by Rita A. Miller, administratrix), assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed May 29, 1969, Ser. No. 845,113

Int. Cl. B64c *13/18*

U.S. Cl. 244—77 E 24 Claims



A system is disclosed for producing aircraft steering command signals for application to the controls of a vertical takeoff and landing (VTOL) or a vertical/short takeoff and landing (V/STOL) aircraft during the transition from cruise flight to hover. A command signal mixing device is provided for processing aircraft command signals as a function of speed to produce steering command signals adapted to simulate the manner in which a pilot normally flies the aircraft. In a preferred form of the invention, vertical-plane path control is effected by routing vertical command information through the command mixer to provide velocity-dependent steering command signals for application to the collective pitch and pitch cyclic controls of the aircraft. Lateral-plane path control is effected by routing lateral command information through the command mixer to produce velocity-dependent bank and turn steering command signals.

3,620,489

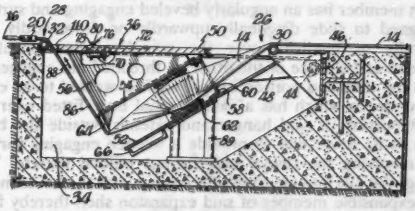
RUNWAY SHEAVE ASSEMBLY FOR AIRCRAFT-ARRESTING GEAR

Harry C. Riblett, Jr., Wilmington, Del., assignor to All American Industries, Inc., Wilmington, Del.

Filed Mar. 16, 1970, Ser. No. 20,004

Int. Cl. B64f *1/00*

U.S. Cl. 244—110 C 24 Claims



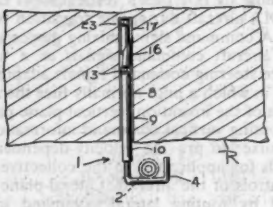
The runway sheaves of an aircraft-arresting gear are mounted at the bottom of a hinged cover assembly and received within a pit prior to activation. The linear payout element is deflected into a deep bend under the closed cover assembly by a knee element. The cover assembly is locked down by shear pins. The strong tensioning of the linear payout element during the initial phase of arrestment breaks the shear pins and raises the cover assembly. The cover assembly is then latched in a raised position to maintain the sheave and payout element elevated above ground level and facilitate their action during arrestment of the aircraft. Fairleads and slots smoothly guide the linear payout element under and through the cover assembly, which is efficiently fabricated from a cover plate and a lower plate disposed at an acute angle beneath it. The sheaves are mounted between an inner plate spaced above and parallel to the lower plate

and the knee element extends downwardly from the edge of the inner plate remote from the hinge. The cover assembly is of truncated V-shape in plan with its narrow end adjacent the runway and a hinge at its wider opposite end. The cover and inner plates are spaced apart by angular channels disposed parallel to the sides of the assembly and a slotted cross channel is secured between the inner and lower plates. A striker bar for the latch is conveniently made from the extended web of a lateral channel mounted beneath the narrower end of the assemblies. The latches and shear pin retainers are mounted on catch plates secured to the pit adjacent the narrow end of the cover assembly.

3,620,490
CABLE HANGER

Francis Eugene Roberts, R.R. #4, Hwy. 41, N., Madisonville, Ky.

Filed Oct. 9, 1970, Ser. No. 79,470
Int. Cl. F16l *3/02*; F16b *13/10*
U.S. Cl. 248—58 **3 Claims**



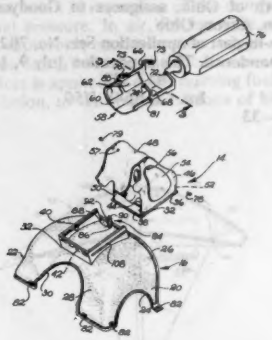
Discloses a cable hanger adapted to fit into a blind hole of a mine roof so as to suspend cable or other power conduit from the roof of a mine. The cable hanger comprises a shaft, bent at one end, to form a hook and threaded at the other end for provision of an expansion shell. The expansion shell consists of an upper relatively immovable member having a smooth axial bore for fitting over the threaded portion of the shaft and a movable lower member containing a smooth axial bore for slidable fit over the threaded portion of said shaft. Each member has an angularly beveled engaging end surface designed to slide diagonally upwardly or downwardly and laterally or medially over the complementary angularly beveled end surface of the other. A threaded nut engageable with the threaded portion of said shaft is welded to an elongated sleeve which has a smooth axial bore fitted over the shaft portion of said hanger and extends outside the blind hole at its lower end to provide a wrench engaging surface for revolving the sleeve and the nut welded thereto. This brings the nut into abutting relationship with the lower movable expansible member of said expansion shell thereby forcing the complementary angularly beveled end surface upwardly and outwardly to expand in said dead hole.
Rotating the sleeve in the opposite direction, thereby revolves the nut allowing the expandable member to move downwardly so that the complementary angularly beveled end surfaces come into axial alignment, allowing the entire mechanism to be removed from the blind hole.

3,620,491
NURSING BOTTLE HOLDER

Paul S. Baclit, 2167 College View Drive, Monterey Park, Los Angeles, Calif.

Filed Apr. 9, 1970, Ser. No. 27,084
Int. Cl. A47d *15/00*
U.S. Cl. 248—106 **6 Claims**

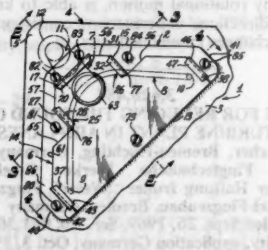
A nursing bottle holder in which a bottle is carried in a pivot mount which is releasably secured on a support member, the support member being formed to straddle a baby whereby to enable the baby to feed from the bottle and allowing ready removal of the pivot mount from the support member.



3,620,492
LEG CONNECTOR ASSEMBLY

Roy E. Jennings, Temple, Tex., assignor to Royal Seating Corporation, Cameron, Tex.

Filed Apr. 30, 1969, Ser. No. 820,543
Int. Cl. F16m *11/16*
U.S. Cl. 248—188 **16 Claims**



A leg connector assembly to provide for rapid connection of legs to articles of furniture. A connector plate secured to the article has a front tab and pairs of side tabs to securely grip a mounting plate driven horizontally between the tabs. Stop means limit the distance the mounting plate can be driven into the connector plate. The locations of the connections of the leg and leg braces with the mounting plate provide superior strength.

3,620,493
GUN HANGER

Ben Huver, Laurel, Mont., assignor to Daniel J. Korn, Sr.; Merritt N. Warden and Wm. C. Walterskirchen, Kallispell, Mont., part interest to each

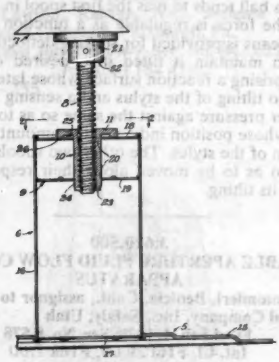
Continuation-in-part of application Ser. No. 785,623, Dec. 20, 1968, now Patent No. 3,556,454, which is a continuation-in-part of application Ser. No. 647,437, June 20, 1967, now Patent No. 3,468,508, dated Sept. 23, 1969. This application Dec. 15, 1969, Ser. No. 885,137
Int. Cl. A47b *81/00*; A47f *5/00*
U.S. Cl. 248—360 **8 Claims**

The gun hanger includes an elongated strip of metal bent for form an inverted generally U-shaped body with spaced legs. The legs are arcuate in cross section and their terminal portions are inset toward one another from the body to form a pair of laterally opposed gripping members. The inset gripping members are coated with plastic rubber to grip about the end of a gun barrel. A clasp is slideably along the

legs to displace the gripping members toward and away from one another thereby to frictionally retain the gun end

between the gripping members. A hook is connected to the body at its upper end whereby the gun may be suspended.

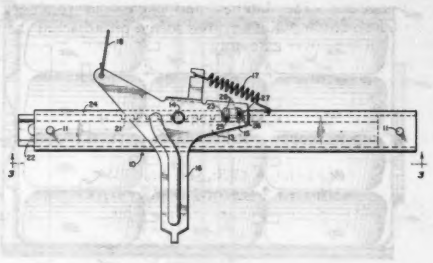
3,620,494
SWIVEL CHAIR
Raoul Hugh De Gaston, Lynwood, Calif., assignor to Henri L. Valette, Long Beach, Calif.
Filed June 29, 1970, Ser. No. 50,570
Int. Cl. F16m *11/00*
U.S. Cl. 248—405 **4 Claims**



A swivel chair having a pedestal, a vertial nut revolubly mounted on the axis of the pedestal and having an enlarged flange frictionally engaged with the upper end of the pedestal, and a screwpost fixedly connected to the bottom of the seat of the chair, and threadedly engaged with said nut, lubricant being provided between the threads of the nut and post, the post at each end thereof having a stop to limit the fully raised and fully lowered positions of adjustment of the seat relative to the pedestal, and the mentioned friction retaining the nut nonrotational relative to the pedestal during height-adjusting movement of the seat and said nut rotating against the resistance of the mentioned friction when the seat is either in its fully extended or fully lowered positions, and, thereby, being swivelly movable while in such positions.

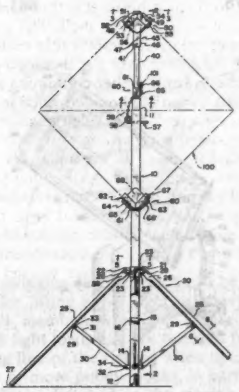
3,620,495
SEAT SLIDE CONSTRUCTION
George Korab, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.
Filed Aug. 18, 1969, Ser. No. 851,025
Int. Cl. B60n *1/08*
U.S. Cl. 248—430 **7 Claims**

The latch members are of two-piece stamped sheet metal construction, in order that greater strength and holding power is obtainable, partly by reason of the closed rectangular form of the two-toothed notch engaging portion of the latch members, as contrasted with only an open U form where the two teeth are in the form of separate projecting tabs integral with and struck from the latch member and therefore susceptible of spreading under load. With the two-piece construction, in which a separate U-shaped tooth part



is fastened to the latch member by hot staking or upsetting, this separate part can be and is preferably made from heavier gauge sheet metal for much greater strength and holding power, which is so important now that seatbelts are in general use attached usually to the seat, thereby placing far greater strains on the seat slide latch mechanism in the event of collision.

3,620,496
SUPPORT STRUCTURES FOR SIGNS AND THE LIKE
Henry Bolt, Elmhurst, and Richard Nelson, La Grange Park, both of Ill., assignors to Bonel Co., Elmhurst, Ill.
Filed Oct. 15, 1969, Ser. No. 866,682
Int. Cl. F16m *11/38*
U.S. Cl. 248—171 **7 Claims**



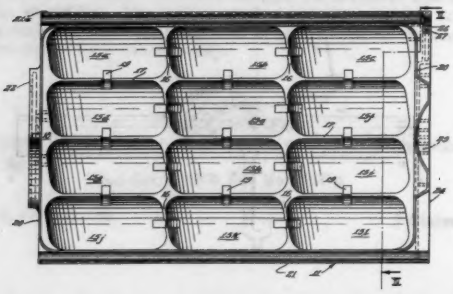
There is disclosed a support structure for road warning signs and the like including a first tubular bar, a second tubular bar telescopically disposed within the first bar, first sign engagement means mounted on the upper end of the second tubular bar, second sign engagement means movably disposed on the first tubular bar, sign stabilizing means movably disposed intermediate the first and second sign engagement means and a plurality of legs provided adjacent the lower end of the first tubular bar, the legs being adapted for movement into a retracted position and a supporting position.

3,620,497

PARALLELOGRAM ICE TRAY CAVITY

Paul W. Schaff, Arlington Heights, Ill., assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed Sept. 15, 1969, Ser. No. 857,822
Int. Cl. B28b 7/06
U.S. Cl. 249—127 8 Claims



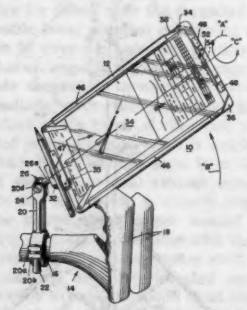
A flexible, deformable ice tray for twist harvest of ice cubes is formed with a plurality of ice cavities having smooth-contoured sidewalls which define in each case a cavity opening in the shape of a parallelogram having a pair of acute angles and a pair of obtuse angles. The depth of each cavity is less adjacent the acute angles than it is adjacent the obtuse angles to provide improved release of the ice cubes upon the application of a torque about the longitudinal axis of the ice tray, the torque being effective to modify the shape of each parallelogram from that of an acute parallelogram to that of a rectangle.

3,620,498

INFORMATION SHEET HOLDER

Julius Tunkl, Lincolnwood, Ill., assignor to Tunkl Industries, Inc., Lincolnwood, Ill.

Filed Oct. 24, 1969, Ser. No. 869,099
Int. Cl. B43l 5/02
U.S. Cl. 248—278 5 Claims



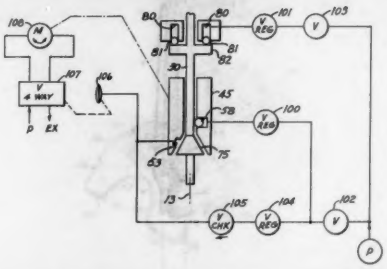
An information sheet holder for mounting on the control column of a vehicle, such as an aircraft, comprising a bracket having one end secured to the column and an opposite end spaced outwardly thereof, connector means is mounted adjacent the outer end of the bracket for pivotal movement about a first axis generally transverse of the column, and holder means including a planar portion is provided for supporting information sheets and the like and including a mounting means at one end for removably connecting the holder to the connector means and supporting the same for pivotal movement about an axis normal to the first transverse axis, whereby the planar portion may be pivoted to expose opposite sides thereof for viewing.

3,620,499

AUTOMATIC TRACER VALVE

Henry E. Rombeck, Valinda, Calif., assignor to Textron Inc., Covina, Calif.

Filed Jan. 6, 1970, Ser. No. 854
Int. Cl. B23q 35/16
U.S. Cl. 251—3 10 Claims



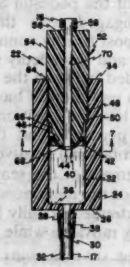
An automatic tracer valve having three mutually perpendicular control axes with a four-way spool valve on each of them. The spool of the first of the spool valves mounts a stylus for axial movement with the spool and for lateral tilting movement in all directions relative to the respective axis. An operator sleeve surrounds the stylus and has a bias bore in which there is a ball that makes a sliding and rolling fluid-sealing fit therein and bears against the side of the stylus to exert a bias force against it causing the stylus to tilt. This force is adjustable by varying the pneumatic pressure on the ball. A second bias bore is aligned with the axis of the first valve and also includes a ball which makes a sliding fit therein. This ball tends to bias the first spool in one direction, and again the force is regulable as a function of pneumatic pressure. Means is provided for sensing deflection of the stylus so as to maintain it tilted in a desired direction, this means comprising a reaction surface whose lateral position is responsive to tilting of the stylus and a sensing port discharging air under pressure against the same so as to form a variable orifice whose position indicates the amount and direction of deflection of the stylus. The other two spools are yoked to the stylus so as to be moved along their respective axes in response to its tilting.

3,620,500

VARIABLE APERTURE FLUID FLOW CONTROL APPARATUS

Louis S. Santomieri, Benicia, Calif., assignor to Deseret Pharmaceutical Company, Inc., Sandy, Utah

Filed Feb. 4, 1970, Ser. No. 8,578
Int. Cl. F16l 29/00; F16k 7/00
U.S. Cl. 251—149.1 2 Claims



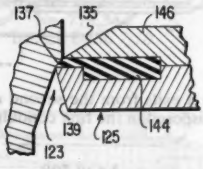
A device and method for controlling the rate of fluid flow through an intravenous infusion tube or the like by varying the dialation of an opening in a diaphragm, and maintaining the dialation without constant attention, the dialation being controlled by the relative position of a male fitting within a female fitting.

3,620,501

NONCHATTERING PRESSURE RELIEF VALVE

Morley V. Friedell, Wheetridge, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Division of Ser. No. 483,039, Aug. 27, 1965, Pat. No. 3,478,775
Filed Sept. 25, 1969, Ser. No. 860,885
Int. Cl. F16k *1/34*
U.S. Cl. 251—333 7 Claims



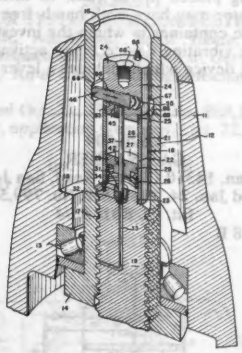
A reciprocating disclike poppet valve is provided with a frustoconical periphery for contact with a cylindrical valve seat which is inclined radially outwards in the direction of flow, the limited angle of inclination insuring that the area of pressure change between the valve and the seat does not increase sufficiently and the effective upstream pressure on the valve does not reduce appreciably from valve closed to valve fully open position to prevent valve chattering.

3,620,502

AUTOMATIC LUBRICATION FOR VALVE STEM THREADS

Richard L. Lawson, Raleigh, N.C., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed July 18, 1969, Ser. No. 843,022
Int. Cl. F16k *41/02*
U.S. Cl. 251—355 13 Claims



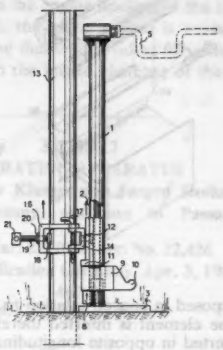
A valve assembly of the type wherein a valve stem operatively connected to a valve closure element is longitudinally moved between open and closed valve positions comprises a longitudinally movable nonrotatable valve stem in threaded engagement with an axially fixed bushing rotatably mounted on said body so that rotation of the bushing in opposite directions effects opposite longitudinal movements of said valve stem. A reservoir of lubricant under pressure is disposed within the stem with passage means extending between said reservoir and an engagement surface zone of the threads. A transverse cylinder on the stem responsive to longitudinal movement of said valve stem in either direction is actuated for automatically feeding lubricant along the passage means from said reservoir toward said zone.

3,620,503

FENCE STRETCHER

Jacques Bro, Paris, France, assignor to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies), Paris, France

Filed Aug. 4, 1969, Ser. No. 847,321
Claims priority, application France, Aug. 6, 1968, 162,089
Int. Cl. E21b *19/00*; B66f *3/00*
U.S. Cl. 254—30 6 Claims



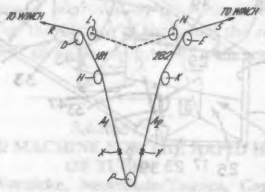
A fence stretcher comprising an elongated tube, abutment means slidable on said tube, clamping means pivotally attached to the abutment means, a hook also slidable on the tube, and means employing a mechanical advantage for moving said hook or said abutment along the tube.

3,620,504

CRANES, DERRICKS, OR THE LIKE LIFTING GEAR

Robert Morrison, Greenock, Scotland, assignor to Speedcranes Limited, Gourock, Scotland

Filed Apr. 2, 1969, Ser. No. 812,749
Claims priority, application Great Britain, Apr. 2, 1968, 15,753/68
Int. Cl. B66d *3/04*
U.S. Cl. 254—188 1 Claim



A crane or swinging derrick which can be quickly and easily converted for lifting either light or heavy loads by means of pulley block members which are secured to the jib when operating with light loads and are released from the jib to engage the lifting line of the rigging when operating with heavy loads and one or more pulley blocks, in particular an adjustable friction block, disposed in the rigging to assist in controlling the movement of the load during lifting and or transfer of the load.

3,620,505

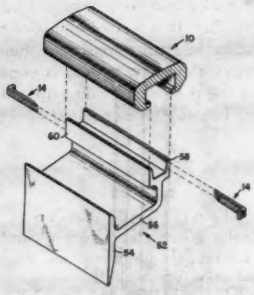
RAILING CONSTRUCTION

Robert H. Murdock, Kensington, Calif., assignor to Railtec Corporation, Emeryville, Calif.

Filed Apr. 27, 1970, Ser. No. 32,086
Int. Cl. E04h *17/14*
U.S. Cl. 256—70 10 Claims

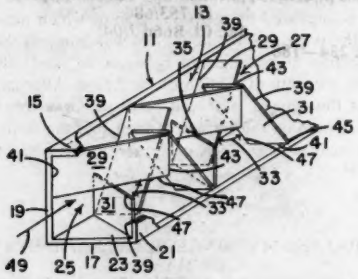
A railing construction in which a continuous aluminum or other metal rail member is provided with a downwardly

directed slot or opening extending along the length thereof. Rail supporting posts, balusters, wall brackets or the like are receivable in said slot at any desired longitudinal spacing. Each of such supporting elements are provided with opposed



sidewalls disposed in spaced relation to the sidewalls of the slot when the element is inserted therein. Wedge members are then inserted in opposite longitudinal directions in such spaces to tightly lock the rail member to the supporting element.

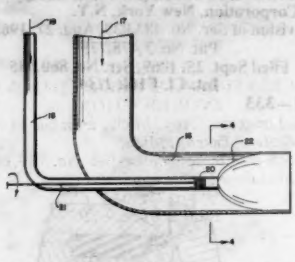
3,620,506
FLUID-MIXING DEVICE
Stephen W. So, Wilmington, Del., assignor to FMC Corporation, Philadelphia, Pa.
Filed July 7, 1970, Ser. No. 52,823
Int. Cl. B01f *5/00*
U.S. Cl. 259—4 **10 Claims**



Fluid-mixing apparatus which includes a plurality of stationary mixing units, formed of planar members, disposed in series longitudinally of a passage for sequentially and repeatedly dividing and recombining fluid flows during the travel thereof through the passage, with the fluid flows being directed along different serpentine paths after each division thereof.

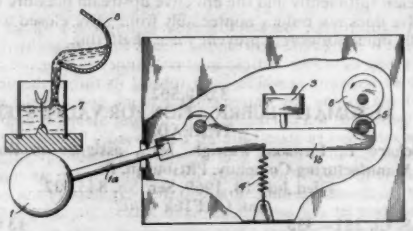
3,620,507
METHOD FOR RAPIDLY MIXING FLUIDS
Vitold R. Kruka, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Jan. 7, 1970, Ser. No. 1,160
Int. Cl. B01f *7/02*
U.S. Cl. 259—25 **3 Claims**

A method for rapidly mixing at least one fluid into another by disposing a first fluid within a first conduit and flowing a second fluid within a second conduit substantially concentric with and disposed within the first conduit, the second conduit opening into contact with the fluid within the first conduit. An angular momentum is imparted to the second fluid within the second conduit to thereby form a swirling jet of the



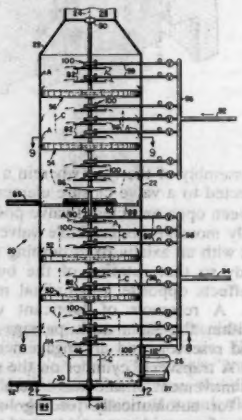
second fluid as it exits from the second conduit into contact with the fluid disposed in the first conduit.

3,620,508
APPARATUS FOR FILLING DENTAL MOLD FLASKS
Hans Lea, Frankfurt am Main, Germany, assignor to Deutsche Gold-Und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany
Filed Sept. 26, 1969, Ser. No. 861,342
Int. Cl. B01f *11/00*
U.S. Cl. 259—72 **3 Claims**



A device to vibrate dental mold flask as the investment material is being placed in the flask to form the mold in which the operator may have both hands free to manipulate the flask and the container in which the investment material was mixed. The vibrating device being activated by placing the mold on the device which includes a lever to be vibrated by a cam.

3,620,509
GAS WASHER
Vernon A. Roman, 14310 Clayton Road, San Jose, Calif.
Filed Jan. 24, 1969, Ser. No. 799,546
Int. Cl. B01f *3/04*
U.S. Cl. 261—18 B **1 Claim**



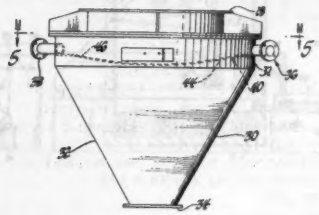
A gas-washer includes means for providing a series of continuous sheets of liquid, through which gas is directed. The

gas is exposed to each liquid sheet for a time sufficient so that gas, after passing through the liquid sheets, is effectively washed.

3,620,510
GAS SCRUBBER WITH TANGENTIAL WATER INTRODUCTION

Lawrence A. Longcore, Troy, Mich., assignor to Arco Industries Corporation, Detroit, Mich.

Continuation-in-part of application Ser. No. 769,182, Oct. 21, 1968, now abandoned. This application Nov. 13, 1968, Ser. No. 775,344
Int. Cl. B05b 7/10
U.S. Cl. 261—79 A 9 Claims

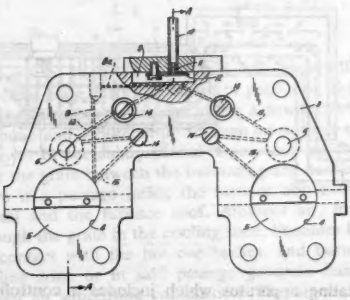


A venturi-type gas scrubber that is improved by the addition of wetting fluid distributing means for evenly distributing a wetting fluid from a fluid inlet onto inner surfaces of a portion of the venturi which taper toward its throat thereby exposing a completely wetted surface to gas entering the venturi from a gas inlet. The fluid-distributing means is embodied in a plurality of ledges spiraling downwardly from an elevated area of the inlet of the venturi with at least one portion of a given ledge overlying a portion of another ledge so that fluid that is introduced tangentially to the periphery of the venturi near its inlet is evenly distributed across the inner surfaces thereof.

3,620,511
CARBURETOR SYSTEM FOR COMBUSTION ENGINES

Gerd Reinhardt, Adelsheim; Horst Heide, Odheim, and Sebastian Flinspach, Binswangen, all of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed Oct. 21, 1969, Ser. No. 868,154
Claims priority, application Germany, Oct. 22, 1968, P 18 04 339.5
Int. Cl. F02m 3/08
U.S. Cl. 261—41 D 8 Claims

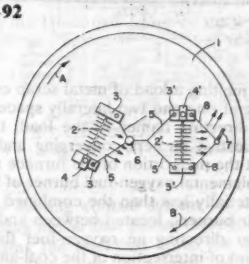


A carburetor system for combustion engines having a relatively long intake duct is provided with a rating system which is arranged separate from the main nozzle system. This idling system is located near the intake of the combustion engine. Under these circumstances, the formation of the idling mixture takes place before its introduction into the engine intake so that there is no possibility of mixture separation. In one proposed embodiment, a check valve is provided for preventing backflow of fuel or fuel-air mixture to affect the idler. In another embodiment, the idling system together with the throttling flap is arranged in a flange interposed between the engine and intake duct. The air nozzle of this idling system is connected to the intake duct by a passage located upstream from the throttling flap. In a further embodiment, the idling system is arranged in the engine housing or the cylinder head itself. In this regard, the idling system is connected to the inlet passage by a line thereby providing for a short route for the idling mixture to the intake chamber of the combustion engine.

3,620,512
AERATING APPARATUS

Josef Muskat; Dieter Klump, and Jurgen Sieckmann, all of Michelbach, Germany, assignors to Passavant-Werke, Hutte, Germany

Filed Mar. 25, 1970, Ser. No. 22,426
Claims priority, application Germany, Apr. 3, 1969, P 19 17 462.0
Int. Cl. B01f 7/10, 7/18
U.S. Cl. 261—92 16 Claims

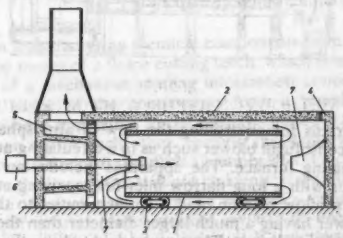


Aerating apparatus for aerating liquids such as sewage sludges, is improved by providing a rotor which moves in a path on the surface of the liquid and which moves the liquid in a direction at an angle of between 90° and 180° with respect to the path of motion of the frame. Alternatively, a device of this type is improved by providing a rotor which moves in a path on the surface of the liquid the rotor axis of which is inclined at an angle of up to 90° with respect to the horizontal.

3,620,513
METHOD AND MACHINE FOR THE RAPID HEATING OF TUBES

Hans-Joachim Wernicke, Neuenhain/Taunus, Germany, assignor to Messer Griesheim GmbH, Frankfurt Main, Germany

Filed Dec. 23, 1969, Ser. No. 887,520
Claims priority, application Germany, Dec. 27, 1968, P 18 17 032.6
Int. Cl. F27b 3/02
U.S. Cl. 263—4 4 Claims



A method and machine for rapidly heating an open-ended tube in a furnace provides for placing the tube on a support

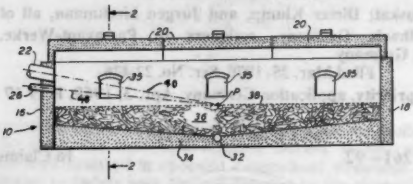
inside a tunnel furnace and projecting the flame of a burner through one of the tube ends into the interior of the tube. The burner thus will act as an injector drawing the exhaust gases, that exit at the other tube end, around to return outside the tube and to reenter the tube at the one end.

3,620,514

FUEL-AIR FIRED FURNACE WITH SUPPLEMENTAL OXYGEN-FUEL BURNER

Lewis J. Geiger, Jr., Edison, N.J., assignor to Air Reduction Company Incorporated, New York, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,840
Int. Cl. F27b *3/02*
U.S. Cl. 263—40 R **15 Claims**



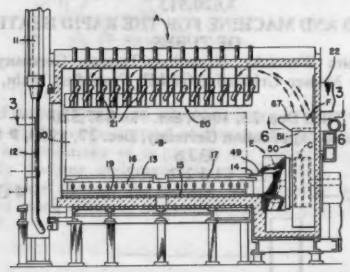
A furnace for melting a load of metal scrap containing pig iron, etc., having at one end two laterally spaced main coal-air burners for directing flames to the load, the projected axes of the respective burners converging and intersecting approximately at the midportion of the furnace near the load level, and a supplemental oxygen-fuel burner of heat generating capacity materially less than the combined capacities of the main coal-air burners, located between and beneath the main burners for directing an oxygen-fuel flame approximately at the point of intersection of the coal-air flames.

3,620,515

APPARATUS FOR CONTROLLING FLOW TO AND FROM A BLOWER

Edwin P. Usiak, Fairview Park, and Albert C. Tucker, Rocky River, both of Ohio, assignors to Lee Wilson Engineering Company, Inc., Cleveland, Ohio

Filed Nov. 20, 1969, Ser. No. 878,438
Int. Cl. F27b *5/16*
U.S. Cl. 263—40 R **4 Claims**



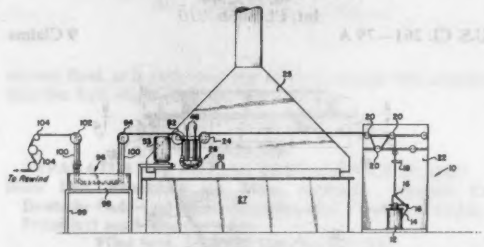
Apparatus for controlling the flow of atmosphere to and from a centrifugal blower such as in a circulating-atmosphere heat-treating furnace. The apparatus includes an inlet flow regulator with a long narrow inlet for receiving atmosphere from a shallow plenum, and a circular outlet to the blower, the blower having a much larger diameter than the height of the inlet and plenum. The regulator equalizes the inlet flow rate across the width of the plenum so that the flow of atmosphere is more uniform throughout the interior of the furnace.

3,620,516

STRESS RELIEVING APPARATUS AND METHOD

Ogle R. Singleton, Jr., Richmond; Sidney B. Kesler, Jr., Chesterfield County, and William E. Warren, Highland Springs, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Sept. 16, 1969, Ser. No. 858,284
Int. Cl. F27b *9/28*
U.S. Cl. 263—3 **18 Claims**



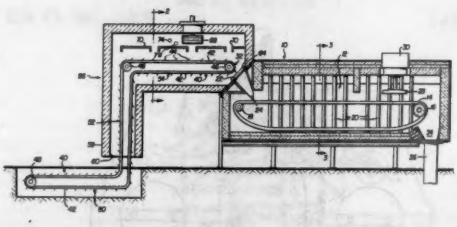
An apparatus for stress relieving an aluminum-containing material by immersion in a molten metal bath. The bath is selected from the group consisting of lead, lead and tin, and lead and bismuth. The aluminum-containing material is fed through the bath at such rapid linear velocities that stripping means must be provided to prevent a pumping action between the material and the bath. In a preferred form when feeding aluminum wire through the bath, this stripping is effected by passing the wire through one or more orifices whose diameter is only slightly larger than the diameter of the wire. A method of producing lead particles is disclosed by slightly increasing the orifice diameter of the stripping means when employing a lead bath.

3,620,517

HEAT-TREATING APPARATUS AND METHOD

William R. Keough, Bloomfield Hills, Mich., assignor to Multifastener Company, Detroit, Mich.

Filed Oct. 27, 1969, Ser. No. 869,755
Int. Cl. F27b *9/14, 13/06*
U.S. Cl. 263—6 R **7 Claims**

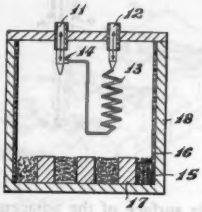


Heat-treating apparatus which includes a controlled atmosphere heat-treating furnace whose exit is closed to the external atmosphere, a conveyor for delivering objects to be treated to the furnace entrance, and a hood covering the conveyor and surrounding the furnace entrance, the entrance of the hood being located at a level equal to or below the floor of the heating chamber of the furnace. Controlled atmosphere gas leaving the furnace entrance is channeled into the hood and is burned therein, thus preheating objects on the conveyor and creating a positive pressure inside the furnace.

3,620,518
PROCESS AND DEVICE FOR THE TREATMENT OF SURFACES OF WORKPIECES IN AN ANNEALING FURNACE

Karl-Heinz Winter, Dornigheim, and Ottwin Krach, Wolfgang Bei Hanau/Main, both of Germany, assignors to Deutsche Gold und Silber-Scheideanstalt Vormals Roessler, Frankfurt(Main), Germany

Continuation-in-part of application Ser. No. 715,669, Mar., 1968, now Patent No. 3,519,257. This application Feb. 25, 1970, Ser. No. 13,939
Claims priority, application Germany, Mar. 28, 1969, P 19 15 866.8, Mar. 23, 1967, D 52, 614
Int. Cl. F27d *17/00*; C21d *1/76*
U.S. Cl. 263—15 9 Claims

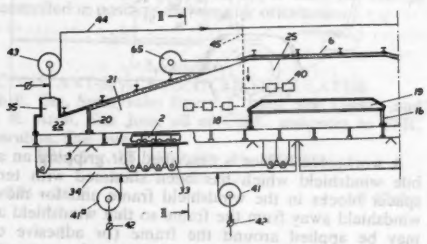


Protective and carrier gases which are to be used in various processes in annealing furnaces are produced in situ with the aid of catalysts applied to the inner surfaces of the furnaces. Preferably the oxygen containing gas is preheated before being mixed with fuel to form the protective or carrier gas.

3,620,519
TRAVELING GRATE APPARATUS AND METHOD

Frank Forbes, Bethel Borough, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1969, Ser. No. 879,491
Int. Cl. F27b *9/00*
U.S. Cl. 263—28 16 Claims

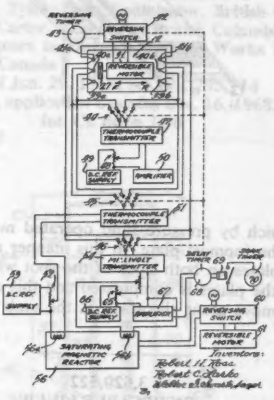


There is disclosed a method and apparatus wherein a traveling grate carries a charge of pellets or like-formed ore bodies through a furnace providing a downdraft heat-indurating zone and subsequently through an updraft cooling zone. A cover or secondary tunnel is provided inside the furnace over the grate between the indurating and cooling zones, and there is a passage inside the furnace above the secondary tunnel and the furnace roof. Ambient air, forced upward through the grate in the cooling zone, becomes highly heated by contact with the hot ore bodies, and burners over the cooling zone or in said passage generate flames with the heated air supporting combustion. The air and products of combustion flow out the passage into the indurating zone where they travel down through the grate to indurate the bed of ore bodies on the grate. Oil burners may be used because the the ore bodies on top of the bed in the indurating zone are substantially shadowed from the direct radiant heat of the flames and therefore prevented from fusing, while the secondary tunnel and the updraft of air in the cooling zone protect said top layer from being heated to fusing temperature. The operation also provides more uniform heating of the ore bodies than the usual practice where there are a succession of individual burners in the heat-indurating zone.

3,620,520
FURNACE HEATING CONTROL SYSTEM

Robert H. Ross; Robert C. Larko, and Walter G. Swartzfager, all of Meadville, Pa., assignors to Sunbeam Equipment Corporation, Meadville, Pa.

Filed July 29, 1970, Ser. No. 59,286
Int. Cl. F27b *3/10*
U.S. Cl. 263—40 R 10 Claims



A furnace heating control system for a furnace using a gaseous heating media that passes through the workload for rapidly bringing the workload up to the desired processing temperature without any "overshoot" of the workload temperature. This control is accomplished solely as a function of the incoming and outgoing temperatures of the gaseous heating media through the workload. In combination with a reversible axial flow fan synchronously switched thermocouples continuously measure the incoming and outgoing temperatures, electrical signals proportional to the incoming and outgoing temperatures are compared to respective reference signals and any resulting excess signals are used to effect reversal of a motor normally driving a heat input valve in a direction so as to increase the heat input. In one embodiment a heating media temperature signal is compared against a variable reference signal which is proportional to the difference between the incoming and outgoing temperatures of the gaseous heating media.

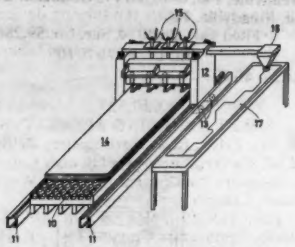
3,620,521
MACHINE FOR FLAME CUTTING OF IDENTICAL COMPONENTS FROM A STACK OF PLATES

Thorsten Ingvar Egon Lundberg, Askim, Sweden, assignor to Aktiebolaget Gotaverken, Goteborg, Sweden

Filed Jan. 5, 1970, Ser. No. 596
Claims priority, application Sweden, Jan. 14, 1969, 384/69
Int. Cl. B23k *7/02*, *7/10*
U.S. Cl. 266—23 E 2 Claims

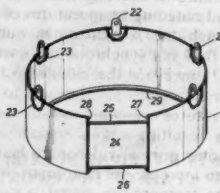
When manufacturing identical components from a stack of plates by means of a flame cutting torch, which is movable by means of a mechanism reading information concerning the desired shape of the components from a templet, it has hitherto been impossible to cut components from two plates placed on top of each other, because the flame will spread out between the plates in such a manner that the component cut from the lower plate will not be identical with the one cut from the topmost plate. To make possible a simultaneously cutting of several plates stacked on top of each other a machine is used, which comprises a crab structure straddling the stack of plates and being movable along the same by a

mechanism which keeps the vertical distance between the crab structure and the table constant during operation. The crab structure comprises two parallel beams between which the torch or torches are movable transversely in relation to the stack of plates. Each beam furthermore carries a set of



rollers which by pressure fluid operated means are forced towards the topmost plate. In this manner a portion of the stack of plates on both sides of the spot where the torches work on the plates is compressed and this compressed portion will move along the stack as the crab structure is displaced.

3,620,522
DISPOSABLE LINER
John B. Bridges, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Apr. 10, 1970, Ser. No. 27,393
Int. Cl. C21c *5/02*
U.S. Cl. 266—43 **10 Claims**



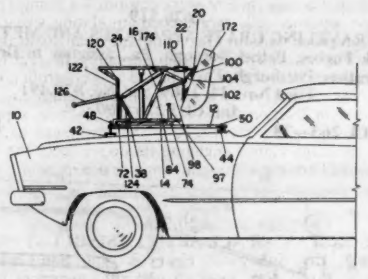
A disposable liner for accumulating deposits of alloy splashing up from the molten alloy in an induction heating furnace comprises a sleeve which fits closely within the upper portion of the furnace crucible and is supported therein by asbestos-covered chains which loop over studs about the upper end of the crucible.

3,620,523
LIQUID CONTROLLED DASHPOT
Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation
Filed June 17, 1969, Ser. No. 834,051
Int. Cl. B60g *11/56*
U.S. Cl. 267—34 **8 Claims**

A housing including opposite ends and a central partition. A pair of opposing resilient cups are disposed within the housing ends and have their open ends sealed relative to the marginal portions of the partition, the latter having a fluid passage therethrough controlled by a one-way valve defining a bleed passage there past when closed. One end of the housing includes a tubular neck having a piston rod slidingly disposed therein provided with a head on its inner end oppos-

ing the outer surface of the adjacent cup end wall and the cups and passage are filled with liquid.

3,620,524
AUTOMOBILE WINDSHIELD INSTALLER
Joseph Czompi, 1850 Williams Road, Columbus, Ohio
Filed June 26, 1970, Ser. No. 50,076
Int. Cl. B25b *11/02;* **B23p** *19/04;* **B25j** *5/02*
U.S. Cl. 269—21 **11 Claims**

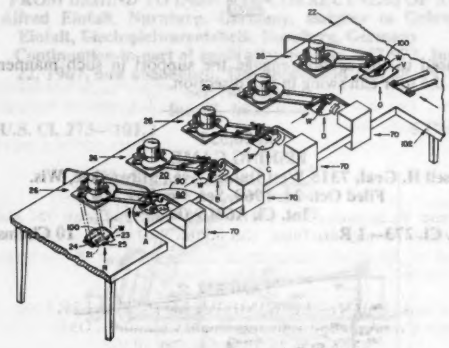


A workpiece holder is described for gripping an automobile windshield which has been shimmed with temporary spacer blocks in the windshield frame and for moving the windshield away from the frame so that windshield adhesive may be applied around the frame (or adhesive covering paper removed) and for subsequently returning the windshield to its exact original position in the windshield frame. The workpiece holder has a base for setting on the hood of an automobile and a carriage slidably mounted to the base. A pivot frame is pivotally mounted to the carriage and has windshield gripping means, including suction cups, pivotally mounted to the pivot frame. A lever mechanism and handle are linked to the pivot frame for pivoting the pivot frame in order to remove the windshield and replace it.

3,620,525
PRODUCTION SYSTEM FOR TREATING FABRIC WORKPIECES IN SEQUENCE AT A PLURALITY OF WORK STATIONS
George F. Hawley, Bogota, N.J., assignor to Ivanhoe Research Corporation, New York, N.Y.
Continuation of application Ser. No. 601,768, Dec. 14, 1966, now abandoned. This application Nov. 24, 1969, Ser. No. 873,748
Int. Cl. B65h *45/02*
U.S. Cl. 270—61 R **12 Claims**

A production system for automatically performing a sequence of work operations upon a plurality of fabric work-

pieces. Each successive workpiece is registered in an initial known position and then is transferred while controlling its position to a first work station to have a predetermined work operation performed at the first work station. The workpiece is successively transferred from the first work station to a second work station while being simultaneously rotated into a different angular orientation relative to the initial registered position and being controlled so as to position the workpiece in a predetermined relationship relative to the second work station, A further operation is performed on each workpiece at the second station and the treated workpieces are delivered in succession from the second work station. An in-



cremental work performing system is described for fabric work pieces which performs increments of an operation; such as creasing at a sequence of work stations for completing the operation automatically while accommodating size changes in the workpiece without corresponding changes in the tooling size. The workpieces may be automatically registered at each workstation and they are moved and controlled in position during movement by a suction lifting clamp and by the differential in friction between the low friction supporting surface engaging the lower face of the workpiece and a high friction movable clamp engaging its upper face, the clamps being controlled in position and angular orientation.

3,620,526

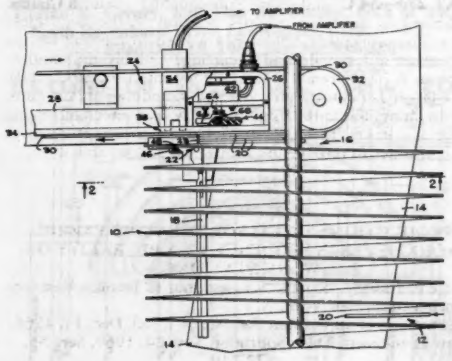
CONSTANT-SPACE ARTICLE SINGULATOR

Kenneth E. Iles, Sunnyvale; Harry J. Jung, San Carlos, and Elmo R. Arell, San Jose, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 15, 1969, Ser. No. 884,931

Int. Cl. B65h *3/12*

U.S. Cl. 271—26 E **1 Claim**



A letter-handling apparatus wherein letters are singulated from a stack of letters and transferred with a uniform spacing along an endless belt utilizes a fluidic edge-sensing device to electrically activate and deactivate a solenoid-operable vacuum pickup box for drawing letters one at a time at equally spaced intervals from the stack of letters. The fluidic edge-sensing device is disposed slightly downstream of the vacuum pickup box so as to sense the leading edge of the first letter withdrawn and simultaneously activate the solenoid to prevent the withdrawal of a subsequent letter until the trailing edge of the first letter passes the sensing device. When the trailing edge passes the sensing device, the sensing device deactivates the solenoid and renders the vacuum pickup box operable to withdraw a second letter.

3,620,527

SHEET HANDLING APPARATUS

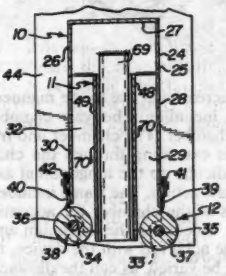
Reginald E. W. Tyler, New Westminster, British Columbia, and Paul M. Carter, Vancouver, British Columbia, both of Canada, assignors to Durand Machine Works Ltd., New Westminster, Canada

Filed Jan. 29, 1969, Ser. No. 795,114

Claims priority, application Canada, Dec. 16, 1968, 037,863

Int. Cl. B65h *3/06*

U.S. Cl. 271—27 **10 Claims**



Apparatus for feeding sheets or panels, singly, from a stack of such sheets or panels comprising of suction head, a pair of parallel drive rolls spaced apart in the direction of feed, the suction head having a pickup extension movable between the rolls to pick up a sheet or panel and bring it into contact with the drive rolls to be fed laterally of the stack to a machine or to some other site.

3,620,528

APPARATUS FOR FEEDING FLEXIBLE SHEET MATERIAL TO A PAIR OF TRANSPORT ROLLERS

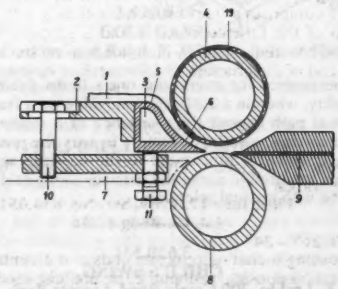
Rudolf Skocir, Koppern/Taunus, Germany, assignor to Maschinenfabrik Turner A. G. Oberursel, Taunus, Germany

Filed Sept. 22, 1969, Ser. No. 859,948

Claims priority, application Germany, June 10, 1969, P 19 29 207.0

Int. Cl. B65h *5/06*

U.S. Cl. 271—51 **10 Claims**



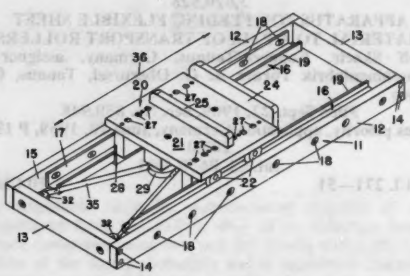
The present invention relates to an apparatus for feeding flexible sheet material such as animal hides to a pair of trans-

port rollers especially in connection with a leather-splitting machine. The invention provides a guide surface which is located adjacent to one of the transport rollers thus creating a guide channel leading into a feed gap between two transport rollers. The guide surface presses the sheet material first against the transport roller which acts as a drive roller with such a looping angle that the sheet material is positively fed into the feed gap.

3,620,529
AQUATIC RECREATIONAL DEVICE
Joseph W. Newman, P.O. Box 5175, Mobile, Ala.
Filed June 3, 1970, Ser. No. 43,004
Int. Cl. A63g *11/00*; A63c *15/02*
U.S. Cl. 272—56 **15 Claims**

A device for recreational use in the manner of a seesaw in a body of water, including a buoyant chamber and a frame attached to the chamber. The chamber and frame are rotatable about an axis extending through the chamber and substantially perpendicular to the longitudinal axis of the frame to provide a seesaw action. The frame includes a pair of seats on opposite sides of the chamber for accommodating a pair of users thereon. To control the maximum amount of seesaw action that can be achieved with the device, the buoyancy of the chamber can be varied, as can the distance between each of the users and the axis of rotation.

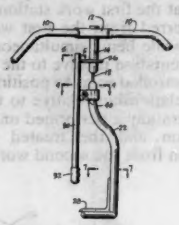
3,620,530
ELASTIC BAND-RESISTANCE EXERCISING DEVICE
Ira R. Cosby, Spokane, Wash., assignor to Verlin R. Kinert, Spokane, Wash., a part interest
Filed Apr. 18, 1969, Ser. No. 817,358
Int. Cl. A63b *21/00*
U.S. Cl. 272—82 **5 Claims**



A contrivance for exercising one's limbs during times of immobility, wherein a carriage is movable on a frame along a reciprocal path against the resistance of a resilient member and the carriage also has structure to vary the position of the resilient member's attachment to the carriage so as to vary the force required to move the carriage along said path in accordance with manual selection.

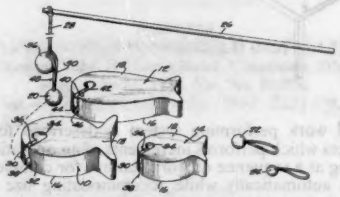
3,620,531
CHILD'S SWING
Robert F. Larkin, 209 Comly Road, Lincoln Park, N.J.
Filed Oct. 20, 1969, Ser. No. 867,717
Int. Cl. A63g *9/16*
U.S. Cl. 272—89 **5 Claims**

My invention comprises a frame with a downwardly extending center support. A swing is provided with an upwardly extending section joined by a cable to the support. Handle means manually operable by a user of the swing and pivotally



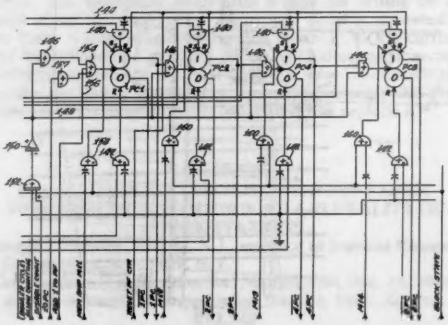
secured to the section engage the support in such manner that the user can swing in any direction.

3,620,532
FISHING GAME
Russell H. Graf, 7315 West Duluth Ave., Milwaukee, Wis.
Filed Oct. 24, 1969, Ser. No. 869,214
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R **10 Claims**



A game for children includes a plurality of imitation fish with simulated fishmouths which in one embodiment are formed by a first bore extending inwardly from the nose of the fish to a cross bore which simulates the eyes of the fish. Channels along the sides of the first bore permit a simulated fish lure in the form of a sphere fixed to a fishline to move into a coupled position in the cross bore. Fish lures of various configurations and bores of different sizes and configurations provide selectivity in coupling the lures for the various fish.

3,620,533
INCREMENTAL PINFALL SYSTEM
Herbert D. Grosvenor, Muskegon, Mich., and Jerome F. Walker, Kirtland, Ohio, assignors to Brunswick Corporation
Filed June 12, 1969, Ser. No. 832,608
Int. Cl. A63d *5/04*
U.S. Cl. 273—54 C **8 Claims**



A bowling scorer including pinfall-counting system for receiving information relative to the number of pins knocked down after the first ball in a frame and relative to the number of pins knocked down by both balls in a frame and for

providing an indication of first ball pin count only and second ball pin count only. The system includes a binary counter and a memory for receiving the complement of first ball pin count from the count. The provision of second ball only pin count is accomplished by loading the counter complement of first ball pin count into the counter from the memory, a count of one is added thereto and thereafter, the pinfall information relative to pins knocked down by both balls is provided to the counter resulting in the same containing second ball only pin count.

3,620,534

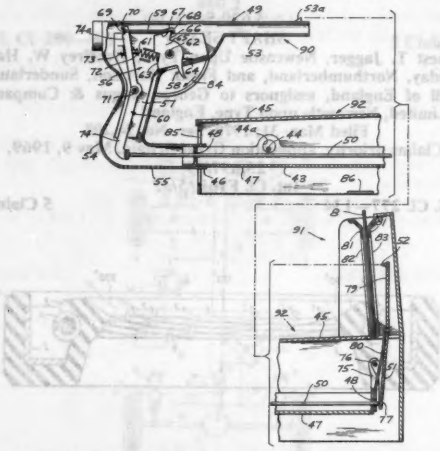
SIMULATED GUN AND TARGET WHICH IS STRUCK FROM BEHIND TO INDICATE CORRECTNESS OF AIM

Alfred Einfalt, Nurnberg, Germany, assignor to Gebruder Einfalt, Blechspielwarenfabrik, Nurnberg, Germany

Continuation-in-part of application Ser. No. 647,972, June 22, 1967, now abandoned. This application Jan. 28, 1970, Ser. No. 6,364

Int. Cl. A63b *9/02*

U.S. Cl. 273—101.2 **5 Claims**



A toy shooting range includes a gun which is movable so that it can be aimed at a target and a striker pin located behind the target. The gun and the striker pin are mechanically coupled so that aiming movements of the gun are translated in corresponding movements of the striker pin. Firing of the gun actuates the striker so as to mark the target at a point corresponding to the aiming of the gun.

3,620,535

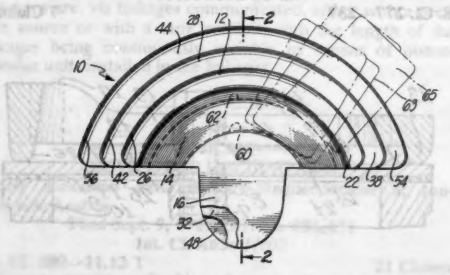
PLAYING CARD HOLDER

Florian B. Cerney, and Tina M. Cerney, both of 1405-1/4 North Havenhurst Drive, Los Angeles, Calif.

Filed Dec. 18, 1969, Ser. No. 886,280

Int. Cl. A63f *1/10*

U.S. Cl. 273—150 **2 Claims**



A card holder which removably supports a plurality of rows of playing cards with the cards in each row spaced side-by-side and with the rows vertically spaced so that all of the cards are within the view of the user. Each row of cards is removably supported in a vertical position between resiliently mounted fan-shaped plates or leaves so that individual cards can be inserted and removed without dislodging adjacent cards.

3,620,536

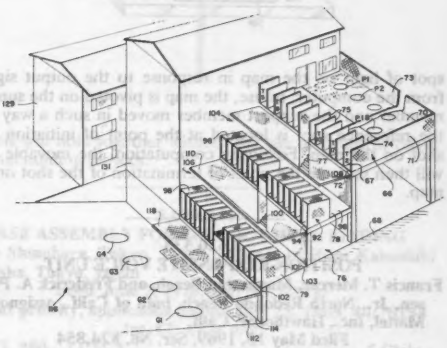
GOLF COURSE

Edward L. Lau, 6000 Kalanianaole Highway, Honolulu, Hawaii

Filed Mar. 6, 1970, Ser. No. 17,229

Int. Cl. A63b *67/02, 69/36*

U.S. Cl. 273—176 A **14 Claims**



A golf course having two parallel fairways and a supplementary green area separating the fairways. A hitting area for hitting golf balls onto the fairways includes a tee level for hitting drive shots onto the fairways and first and second approach levels positioned in front of and vertically below the tee level for hitting approach shots onto the fairways. Protective screens separate the levels from each other so that golf balls hit on one level cannot injure players on another level. The fairways have a first group of target greens at their far end and a second group of target greens are spaced along the fairways at different distances from the front of the tee level. The fairways slope downward toward the tee area and may be formed as part of the existing terrain. Alternatively, the fairways may be made of a green colored wire mesh material including upwardly projecting bumpers. Gutters are provided at the sides of the fairways for retrieving driven golf balls. Deflectors, adopted to be moved, separate the gutters from the fairways. The target greens are in the form of panels having the front ends supported by jacks to permit tilting same. Balls are removed from the supplementary green area by a system of rollers which sweep across same and move golf balls into a centrally located gutter. Golf putting greens are located behind the tee areas.

3,620,537

GOLF GAME

Robert M. Conklin, and Ralph E. Witucki, both of Muskegon, Mich., assignors to Brunswich Corporation

Division of Ser. No. 588,856, Oct. 10, 1966, Pat. No. 3,501,152

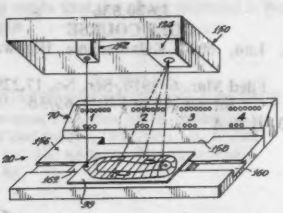
Filed June 23, 1969, Ser. No. 870,748

Int. Cl. A63b *69/36*

U.S. Cl. 273—185 A **10 Claims**

A plotting device for use in an indoor golf game having a computer that provides output signals representative of the distance the ball struck from the tee would have traveled in a first direction coinciding with an intended line of flight and in a second direction transverse to the first direction. The plotting device includes a planar map of a hole on a golf course with the map including indicia defining a cup for the hole. The map is supported on a member slidable on a plotting table and is connected to the slidable member by

means of a pivotal and releaseable connection. The connection provides for pivotal movement of the map on the supporting member about an axis coincident with the cup and transverse to the plane of the map. Also provided is a reference spot projector which projects a stationary spot of light on the map and a projector for projecting a movable



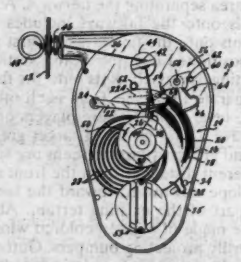
spot of light on the map in response to the output signals from the computer. In use, the map is pivoted on the support member and the support member moved in such a way that the reference spot is located at the point of initiation of a shot on the map. Following computation, the movable spot will then indicate the point of termination of the shot on the map.

3,620,538

POSITION-RESPONSIVE VOICE UNIT

Francis T. Mercer, Manhattan Beach, and Frederick A. Petersen, Jr., North Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed May 15, 1969, Ser. No. 824,854
Int. Cl. G11b *3/08, 25/04*
U.S. Cl. 274—1 A **11 Claims**



A toy phonograph which selects one of a plurality of sound tracks in accordance with the orientation of the toy, comprising a tone arm mounted for lateral movement to engage any of the tracks and a selecting member movable by gravity to direct the tone arm into a particular track. In one position of the toy, the selecting member is moved to a position where it abuts the tone arm to force it to engage a first track, and in a second position of the toy, the member moves to a position clear of the tone arm to allow it to engage another track. The toy has a plurality of sides with different designs, and the recording which is selected at any orientation of the toy is appropriate to the design to be viewed at that orientation, such as the design on the upwardly facing side.

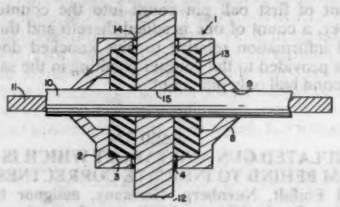
3,620,539

MOISTURE-PROOF WIRE HOLDER

Maceo M. Lanier, and Nathan P. Williams, both of Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

Filed Aug. 23, 1968, Ser. No. 754,882
Int. Cl. F16j *15/10*
U.S. Cl. 277—63 **2 Claims**

A moistureproof wire holder for attachment to a panel and for holding wires in a fixed position when the wires are passed through a hole of substantially equal diameter in the panel. The holder is a two part device, one part placed on each side of the panel. Each part is made of a silicone rubber member fitted into a recess portion of a plastic or metal clamp. The clamps exert a spring action on the wires to resist



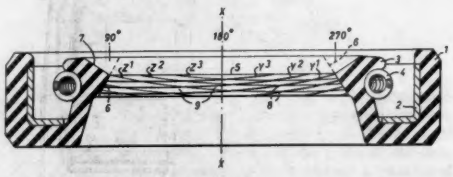
movement away from the panel, thereby compressing the rubber into a moistureproof seal between the clamp and the panel. The silicone rubber also maintains a positive moisture seal around the wire.

3,620,540

SHAFT SEALS

Ernest T. Jagger, Newcastle Upon Tyne; Geoffrey W. Halliday, Northumberland, and Frank Harrison, Sunderland, all of England, assignors to George Angus & Company Limited, Newcastle upon Tyne, England

Filed Mar. 31, 1970, Ser. No. 24,208
Claims priority, application Great Britain, May 9, 1969, 23,697/69
Int. Cl. F16j *15/32*
U.S. Cl. 277—134 **5 Claims**



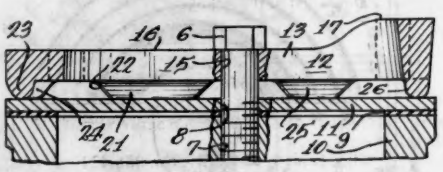
A lip-type shaft seal with a sealing band between opposite frustoconical surfaces has two or more arcuate ridges, or sets of ridges, molded on the outer frustoconical surface so that they mutually intersect and their ends intercept the sealing band to provide two or more pairs of feedback vanes surfaces effective for either direction of relative shaft rotation.

3,620,541

SEALPLATE STIFFENER RING FOR AIRBRAKE SERVICE PORTION COVER

William R. Page, Winnetka, Ill., assignor to P.E.P. Inventions Inc., Chicago, Ill.

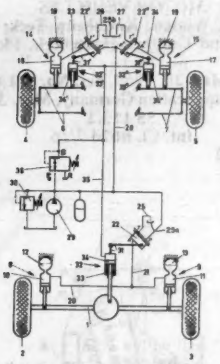
Continuation-in-part of application Ser. No. 857,453, Sept. 12, 1969, now abandoned. This application Mar. 3, 1970, Ser. No. 16,084
Int. Cl. B65d *55/00*
U.S. Cl. 277—237 **7 Claims**



The invention relates to a stiffening member for the cover of a pressurized container for fluids such as air, particularly

to a stiffening member for the cover of such body. It is particularly designed as a seal plate stiffener ring for an airbrake service portion cover. The stiffening member preferably comprises a ring of rigid material having bolt holes therethrough corresponding to boltholes in the cover and in the body of the container with projections on the bottom of the stiffening member between the boltholes following the general contour of the cover in order to apply pressure between the cover and the body of the container between the boitholes. Preferably, the stiffening member is in the form of an elongated ring. In addition, projections may be provided on the bottom of the plate to provide pressure points on the cover.

3,620,542
LEVEL CONTROL ASSEMBLAGE FOR VEHICLES
Reiner Hovorka, Wuppertal-Barmen, Germany, assignor to Langen & Company, Dusseldorf, Germany
Filed Apr. 17, 1969, Ser. No. 817,045
Claims priority, application Germany, May 15, 1968, P 17 55 480.2
Int. Cl. B60g *17/04*
U.S. Cl. 280—6.1 **5 Claims**

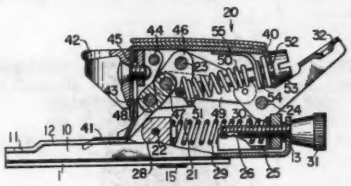


A level control assemblage for vehicles for stabilizing the distance between the vehicle body and one or more wheel-supporting means independently of load variations at the vehicle and maintaining the distance constant at a preselectable value in which setting or regulating cylinders are connected in series with spring components between the vehicle body and the wheel-supporting means. The pressure spaces of the setting cylinders are connected, dependent upon the distance between the vehicle body and the wheel-supporting means, via one or more level control valves to which the distances are, via linkages communicated, either with a pressure source or with a tank conduit, with the length of the linkages being continuously variable by means of piston-cylinder units installed in the linkages.

3,620,543
DEVICE FOR HOLDING SKIS
Gunter Alexander Peis, Richard-Wagner-Strasse 9, Innsbruck, Austria
Filed Sept. 9, 1969, Ser. No. 856,431
Int. Cl. A63c *11/02*
U.S. Cl. 280—11.13 T **21 Claims**

Skis are constructed with at least one permanent magnet fixed inside one ski in the middle zone related to the ends of the ski and at least one ferromagnetic element fixed in the same zone of the other ski of the pair such that when the pair are placed together with their running surfaces face to face, the skis will hold together without the use of straps or other external holding devices.

3,620,544
BASE ASSEMBLY FOR SKI BOOT HEEL BINDING
Kesao Shinohara, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan
Filed June 2, 1970, Ser. No. 42,732
Claims priority, application Japan, July 25, 1969, 44/70154
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **5 Claims**

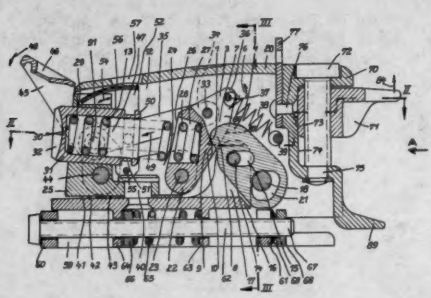


A base assembly for fixing a ski heel binding body to a ski comprises a fixing metal member provided with a sheath portion at its rear portion. It is fixed to the upper surface of the ski by screws threaded through fixing holes in the member. A guide plate includes a tongue portion to engage with the sheath portion of the fixing metal member and holes at its fore-end corresponding with the fixing holes at the fore-end of the fixing metal member when the tongue portion is engaged with the sheath portion. The guide plate is easily fixed to the fixing metal member by the tongue portion and by the screws threaded through the holes at the fore-end of the guide plate and the fixing metal member.

3,620,545
SAFETY CLAMP FOR SKI BINDINGS EMPLOYING A COMBINED VERTICAL AND HORIZONTAL SWING CATCH
Heinz Korger, and Heinrich Eckel, both of Munich, Germany, assignors to Firma Heinrich Eckel, Munich, Germany
Filed Oct. 21, 1969, Ser. No. 868,186
Claims priority, application Germany, Nov. 2, 1968, P 17 03 719.3
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **24 Claims**

A safety clamp for a ski binding includes a support assembly for attachment to a ski and a hood member pivotally mounted relative to the support assembly for engaging a ski boot in a releasable manner. Positioned within the hood member is a spring-loaded catch assembly composed of a common control member releasably engageable with a com-

mon support member so that the catch member can swing in the vertical and horizontal directions. The catch member is secured to the hood member and the catch support is secured to the support assembly. A domelike sensing surface on the catch member is movable in the vertical and horizontal directions while in contact with a control surface on the catch support. When an overload is transmitted to the catch assembly, the catch member rides off the control surface on the catch support and the hood member, in turn, releases the ski boot.

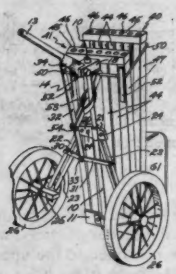


3,620,546

GOLF CART WITH CLUB RACK FOLDABLE BY CART HANDLE

John H. Andersen, 654 Broadway, Bethpage, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,466
Int. Cl. B62d *3/00*
U.S. Cl. 280—40 **9 Claims**



In a conventional wheeled cart for closed by transporting golf clubs there is substituted for the usual club-carrying bag a dual rack of the folding type wherein at least one of two slablike rack sections is inclinable relatively to the other section between open and closed conditions of the rack. The opening and closing of the rack is performed by swinging movement of a handle by which the cart is hauled. In a cart wherein the ground wheels of the cart are shifted between spread and retracted positions such shifting of the wheels positions is caused by swinging of the same handle that hauls the cart wherefor opening and/or closing of the rack takes place simultaneously with the spreading and retracting of the ground wheels of the cart.

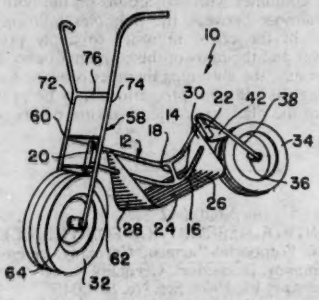
3,620,547

SCOOTER

Milton J. Vaverek, 4420 Joslyn Road, Pontiac, Mich.

Filed Aug. 25, 1969, Ser. No. 852,735
Int. Cl. B62b *3/00*
U.S. Cl. 280—84.04 A **8 Claims**

The scooter is designed basically to be operated downhill using gravity as the motive power. The front wheel is turned conventionally by means of a steering mechanism including handlebars. The rear wheel turns automatically upon tilting of the scooter frame. The pivotal axis of the rear wheel is inclined upwardly and forwardly and theoretically intersects the ground at a point forwardly of the point where the rear wheel touches the ground. This geometry results in the rear wheel turning in the same direction as the frame is tilted.

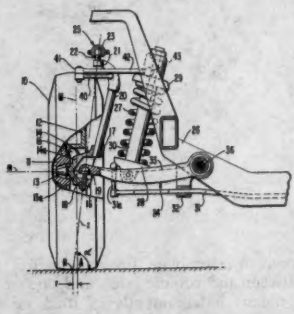


3,620,548

SUSPENSION OF STEERABLE FRONT WHEELS OF MOTOR VEHICLES

Friedrich H. Van Winsen, Kirchheim Teck; Kurt Trachte, Echterdingen, and Gunther Haverbeck, Plochingen, all of Germany

Filed Mar. 28, 1969, Ser. No. 811,455
Claims priority, application Germany, Mar. 30, 1968, P 17 55 113.2
Int. Cl. B62d *7/16*
U.S. Cl. 280—96.2 **15 Claims**



A suspension for the steerable front wheels of motor vehicles by means of superposed guide members in which the joint connecting the lower guide member with the wheel carrier is arranged either partially or completely on the inside of an approximately trough-shaped recess of the brake disk or the like approximately at the height of the wheel center.

3,620,549

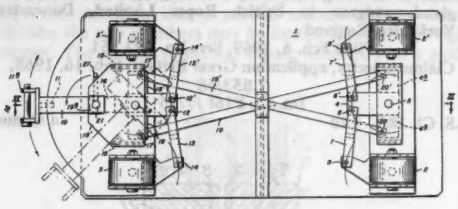
INDUSTRIAL TRAILER WITH SELECTIVE ONE- OR TWO-END STEERING

Robert G. Miller, and Ernest H. Radaker, both of Pittsburgh, Pa., assignors to Phillips Mine & Mill Supply Co., Bridgeville, Pa.

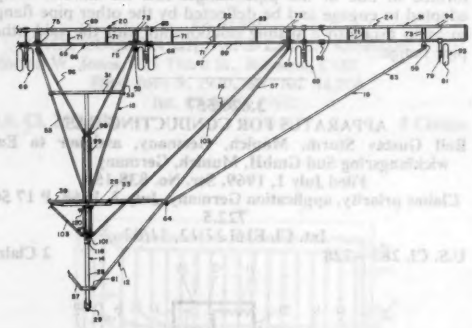
Filed Oct. 2, 1969, Ser. No. 863,082
Int. Cl. B62d *13/06*
U.S. Cl. 280—99 **5 Claims**

There is disclosed a four-wheeled vehicle having two swiveled front wheels and two swiveled rear wheels. There is a tong or drawbar at the front that rotates in an arc about a pivot and which is connected with the front wheels to steer the vehicle in the direction to which the drawbar is turned. There is a block rotatable about the same point with cross links attached thereto and connected with the rear wheels. A

latch selectively connects this block with the vehicle body to hold the block and rear wheels from swiveling or for connecting the block for arcuate movement with the drawbar to simultaneously swivel the front and back wheels.

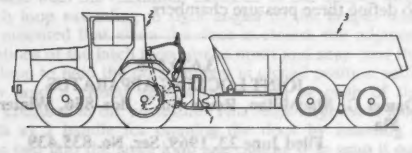


3,620,550
DOUBLE-FOLD FRAME STRUCTURE
Richard J. Hornung, Spearville, Kans.
Filed Nov. 3, 1969, Ser. No. 873,525
Int. Cl. B60d *1/14*
U.S. Cl. 280—476 A **5 Claims**



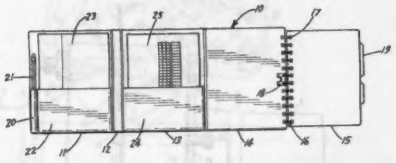
This invention is a double-fold frame structure usable in farm machinery to support harrow tooth members and the like and movable from the extended earth-working condition through a series of folding maneuvers into a compact unit easily movable upon the highway, through gates, etc. More particularly, this invention is a frame structure to be pulled normally by a farm tractor including lift bar assemblies and pull bar assemblies to maintain a rigid structure when in the earth-working condition but permitting the same to be easily moved into a compact, transport condition with the aid of hydraulic control means.

3,620,551
TRAILER COUPLINGS
David J. B. Brown, Stroud, England, assignor to Winget Limited, Rochester, Kent, England
Filed June 20, 1969, Ser. No. 835,031
Int. Cl. B60d *1/00*
U.S. Cl. 280—479 **2 Claims**



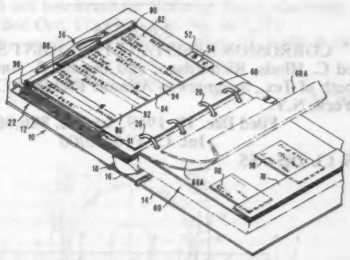
A coupling for interconnecting wheeled vehicles, such as a tractor and a trailer. The coupling is of two parts, one part being movable between coupled and uncoupled positions with the other part. Preferably one part is pivotally mounted on a tractor and provides for movement about both vertical and horizontal axes.

3,620,552
DISPLAY DEVICE
Richard W. Woodcock, Nashville, Tenn., and John P. Yackel, Circle Pines, Minn., assignors to American Guidance Service, Inc., Circle Pines, Minn.
Filed Sept. 15, 1969, Ser. No. 857,726
Int. Cl. B42d *3/16*
U.S. Cl. 281—33 **2 Claims**



A presentation folder for the display of test or other educational material or sales or promotion material, or the like. The device is a compact unit for storing and displaying pictorial and/or typographical material printed or otherwise reproduced on pages within the device. When closed, it is in the form of a book. When opened, it assumes the form of an easel presenting stimulus material. The unit includes relatively stiff front and back covers hinged to a spine and includes a plurality of pages of pictorial and/or typographical stimulus material loosely bound, as by spiral or other wire binding, or the like, for flipping from one side to the other of the easel formed when the device is opened.

3,620,553
COMBINED CHECK AND RECORD-KEEPING BOOK
Marion Donovan, 418 Harbor Road, Southport, Conn.
Filed Dec. 9, 1968, Ser. No. 782,202
Int. Cl. B41l *1/20, 3/00;* **B42d** *15/00*
U.S. Cl. 282—8 C **8 Claims**



A refillable checkbook and record-keeping combination for use with conventional bank checks and special preprinted record forms on which the data written on the checks is duplicated when the checks are written. A holder of particular form is secured in a looseleaf notebook and is so constructed as to hold the checks in a definite position so that they and record forms also secured in the book may be moved into registry and held in registry while the checks are being written. The record forms each include a permanent record sheet, preferably with detachable sheets for forming nonnegotiable duplicate copies of individual checks, and the permanent record sheets also provide spaces for entry of deposits and other information relating to the bank account all arranged to facilitate accurate balancing and reconciling of the account. Certain of the modifications disclosed provide a storage pocket on the permanent record sheet for related papers such as deposit slips. Further modifications in-

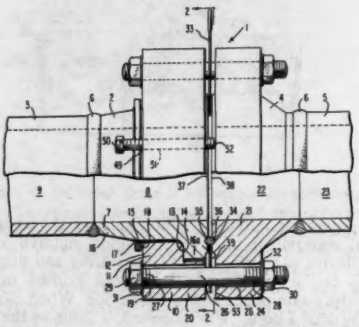
clude simplified versions of the checkbooks for pocket use in which preprinted record forms are so attached to the book that they are readily movable into registry with the checks for making duplicates as the checks are written.

3,620,554

SUBMERGIBLE FLANGE COUPLING AND GASKET

Delbert R. Ward, and William R. Rochelle, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed May 15, 1969, Ser. No. 824,959
Int. Cl. F16l *23/00*
U.S. Cl. 285—18 **3 Claims**



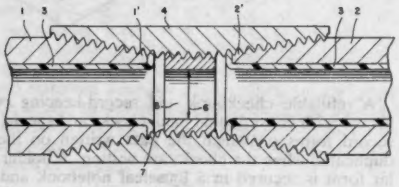
Coupling apparatus for interconnecting submerged conduit sections, which apparatus includes coupling connecting members and coupling jack units which are generally circumferentially dispersed about the submerged coupling apparatus. The coupling jack units are operationally independent of the coupling connecting units.
A bifurcated guide and a handle facilitate the installation of a seal between coupling members of the apparatus.
A coupling including a circumferentially translatable, flange-jacking assembly.

3,620,555

CORROSION RESISTANT PIPE JOINT SYSTEM

Fred C. Hinds, Richardson, and Donald R. Anthony, Dallas, both of Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,064
Int. Cl. F16l *15/00*
U.S. Cl. 285—55 **6 Claims**



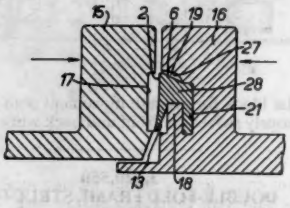
A pipe joint system which resists corrosion comprising a coupling means joining at least two sections of metal pipe, an electrically insulating coating over the interior surface of the pipe, and at least one arcuate member carried in electrical contact with the coupling means, the arcuate member being more electronegative than the pipe and of a configuration such that the member does not extend substantially into the flow path of fluid through the pipe and coupling means.

3,620,556

SEALING RING FOR PIPE COUPLING

Arthur L. Paddington, Thorpe Willoughby, near Selby, England, assignor to British Ropes Limited, Doncaster, Yorkshire, England

Filed Feb. 6, 1969, Ser. No. 797,151
Claims priority, application Great Britain, Feb. 16, 1968, 7,853/68
Int. Cl. F16l *17/06*
U.S. Cl. 285—110 **4 Claims**



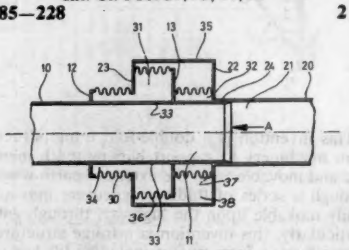
A sealing ring for making a fluidtight joint between the opposing faces of two pipe flanges, the sealing ring being made on an elastomeric material and having an annular portion shaped to be retained in sealing relationship with a seating formed in one of the pipe flanges and an annular flange adapted to engage and be deflected by the other pipe flange so as to establish a sealing relationship with the said other pipe flange.

3,620,557

APPARATUS FOR CONDUCTING GAS

Rolf Gustav Sturm, Munich, Germany, assignor to Entwicklungsring Sud GmbH, Munich, Germany

Filed July 1, 1969, Ser. No. 838,159
Claims priority, application Germany, July 3, 1968, P 17 56 722.5
Int. Cl. F16l *27/12, 51/02*
U.S. Cl. 285—228 **2 Claims**



An apparatus for compensating for the thermal expansion of a gas duct. Two ducts are coaxially positioned for sliding engagement. The inner duct is provided with a pair of parallel, outwardly projecting flanges. The end of the outer duct is provided with an outwardly disposed flange, the ends of which are formed to define a cylindrical segment coaxial with the inner duct. The free end of the cylindrical segment is inwardly formed to define an inwardly disposed flange which is positioned between the pair of flanges projecting from the surface of the inner duct. Cylindrically shaped accordion bellows are secured to the adjacent surfaces of the flanges so as to define three pressure chambers.

3,620,558

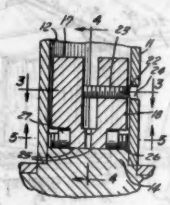
JOINT LOCKING APPARATUS

Daniel G. MacMillan, Route No. 1 Box 856, Winter Haven, Fla.

Filed June 23, 1969, Ser. No. 835,439
Int. Cl. F16b *7/00*
U.S. Cl. 287—54 **13 Claims**

A joint locking device for use in the construction of knockdown furniture, display cases, and the like, where a

structure is to be readily assembled to a predetermined configuration and then readily collapsed for transportation or reassembly. One member of a structural frame has a locking insert for insertion into a second member of the frame whereby the two members may be locked together in a rigid manner. The locking insert has a base member with a guide



groove therein and a pair of sliding locking members having slide bars for sliding in the guides in the base. The locking members may be forced apart for gripping the internal walls of the second frame member, thereby locking the two frame members together. The sliding lock members are forced apart by a setscrew with access to the setscrew provided by a small aperture in the side of the frame member.

3,620,559

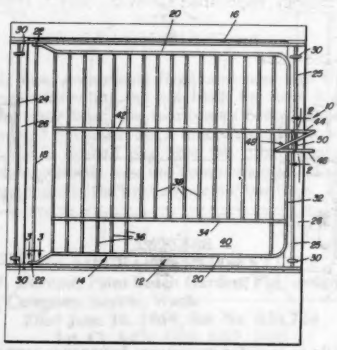
CAGE DOOR HANDLE AND LATCH ASSEMBLY

Morton W. Jones, 925 Third St., Ramona, Calif.

Filed June 9, 1970, Ser. No. 44,774

Int. Cl. E05c *19/02*

U.S. Cl. 292—76 **5 Claims**



This device is a door handle and latch assembly for use on animal enclosures, such as cages or the like, particularly for small animals such as chinchilla, rabbits, mice, rats, mink, poultry, etc.

It consists of a small tight loop or wire keeper projecting from the door jamb or cage wall adjacent the doorway of the cage, and a large open latch loop of resilient wire or metal rod having a succeeding convolution spaced apart a distance slightly less than the maximum diameter of the keeper loop, the latch loop extending at right angles to the keeper loop and so mounted that when the door is closed, the adjacent convolutions of the latch loop spread apart and snap over the keeper loop to hold the door latched in closed position sufficient to hold it closed against the weight or push of the animals confined in the enclosure. This same large latch loop also acts as a handle for opening the door by inserting a finger or two into the large loop and pulling it to snap it out of engagement with the keeper loop, or by twist flexing the handle loop to somewhat enlarge the convolution spacing enabling the handle to easily withdraw from it the keeper loop and open the door.

3,620,560

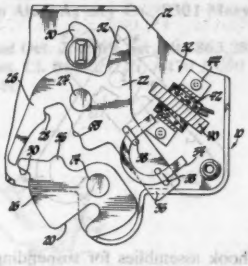
VEHICLE CLOSURE LATCH

Theodore F. Peters, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 2, 1969, Ser. No. 863,087

Int. Cl. E05c *3/26*

U.S. Cl. 292—201 **3 Claims**



A minimum-release-type of vehicle deck lid or other closure latch which includes fork latchbolt and detent lever elements provided with cam out detent shoulders and which further includes a magnetic holding arrangement for the detent lever normally opposing the cam out latch-releasing tendency of the latter until an electromagnet is selectively briefly energized to neutralize the permanent magnet and permit release of the latch.

ERRATUM

For Class 292—262 see:
Patent No. 3,620,483

3,620,561

TRANSPORTING DEVICE FOR USE IN CONNECTION WITH THE MANUFACTURE OF UNVULCANIZED BELTED TIRES

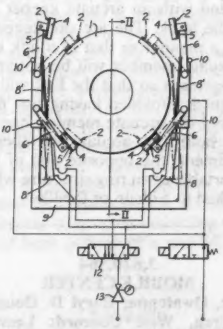
Klaus Grotkasten, Hamburg, and Ingo Hirschkorn, Neu-Wulmstorf, both of Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 17, 1969, Ser. No. 867,270

Claims priority, application Germany, Oct. 19, 1968, P 18 04 097.6

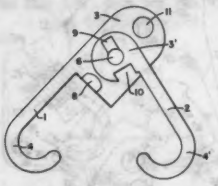
Int. Cl. B66c *1/62*

U.S. Cl. 294—67 BC **3 Claims**



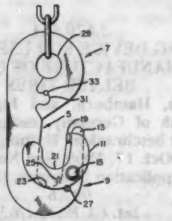
A transporting device for a raw tire, especially belted raw tire, which includes a frame having two diametrically opposite areas thereof pivotally connected to two pairs of arms carrying angle-shaped tire engaging gripper members for engaging shoulder areas and circumferential areas of said tire while control means are provided for controlling said arms.

3,620,562
CONNECTOR-HOOK ASSEMBLY
Masataro Sato, No. 28-26, Fukuakamachi 2-Chome, Takamatsu, Japan
Filed Apr. 20, 1970, Ser. No. 30,191
Claims priority, application Japan, Oct. 13, 1969, 44/97764
Int. Cl. B66c 1/34
U.S. Cl. 294—82 4 Claims



Connector-hook assemblies for suspending or lifting cargoes, fastening lines together, attaching a bracelet and the like, in which pairs of complimental hook elements are pivotally connected and include a displaceable lock comprising cooperating lock-notch portions and an abutment on respective hook elements or on the pivotal element therebetween, and in which at least one of the hook elements includes a portion for connection to a line, chain link or the like.

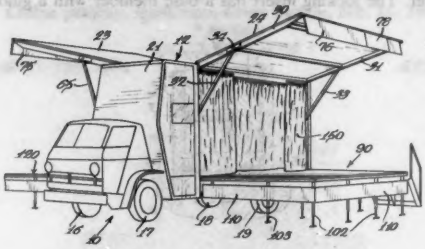
3,620,563
LOCKING LINK
George W. Pierce, 340 W. 29th Ave., Eugene, Oreg.
Filed Oct. 20, 1969, Ser. No. 867,497
Int. Cl. B64d 17/38
U.S. Cl. 294—82 1 Claim



A locking link structure is provided having a hooklike member at one end with an arcuate keeper located on the tang portion of the hook. The arcuate keeper is pivoted to the hook in such a manner so that as a link is placed within the hook, the arcuate member will be automatically turned into locking engagement so that the link will not slip out of the hook. A detent is provided having two positions one of which tends to hold the arcuate member open and the other which tends to hold the arcuate member closed. In a preferred embodiment, the opposite end of the link is provided with a distortable open ring structure whereby it can be permanently hooked to a chain or the like.

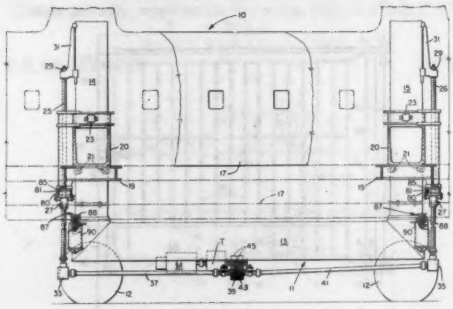
3,620,564
MOBILE CENTER
Jerry A. Wenger, Owatonna; Daryl D. Douglas, Owatonna; Harvey M. Urch, West Concord; Leonard Nordman, Owatonna, and John N. Polivka, Minneapolis, all of Minn., assignors to Wenger Corporation
Filed Oct. 13, 1969, Ser. No. 865,616
Int. Cl. B60p 3/34
U.S. Cl. 296—23 15 Claims

A mobile center having a body and chassis with ground-engaging wheels and with an over-the-road capability wherein the body has a roof, sides and ends with the sides being defined by a pair of raisable canopies and with a pair of floor structures disposed within the body and interiorly of the canopies for over-the-road travel. The floor structures can be lowered from each side of the body to provide floors beneath the canopies with powered actuating means for operating one



or both of the canopies and floor structures between operative and inoperative positions. Also, enclosures are hingedly connected to the canopies and to the floor structures to enclose the space between the floor structures and canopies to provide additional uses for the mobile center.

3,620,565
AIRCRAFT PASSENGER TRANSFER VEHICLE
Walter S. Eggert, Jr., Huntingdon Valley, and James M. Herring, Jr., Merion Station, both of Pa., assignors to Boothe Airside Services, Inc.
Filed Oct. 16, 1969, Ser. No. 867,048
Int. Cl. B62d 31/02
U.S. Cl. 296—28 A 5 Claims

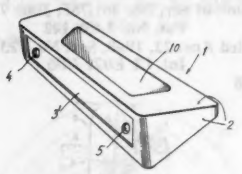


A vehicle to transfer passengers between a terminal building and parked aircraft. The vehicle includes a chassis having a main central beam and two upright guide posts at each end. A pod for containing the passengers is mounted for movement on the masts. Lift drive apparatus in the form of screw means suspended from the guide posts and connected to a power source may be driven to raise and lower the pod. Spring means housed in pockets on the chassis at the base of the masts provide suspension for the pod when the same is lowered and the vehicle is driven across the ground surface.

3,620,566
DOOR ARMRESTS OF AUTOMOTIVE VEHICLES
Jacky Leconte, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France
Filed Nov. 12, 1969, Ser. No. 875,837
Claims priority, application France, Nov. 13, 1968, 173,512
Int. Cl. B60n 1/06
U.S. Cl. 296—153 2 Claims

Armrest for the passengers' compartment of automotive vehicles, of the type comprising a resilient external body enclosing a metal element adapted to coact with an element of the vehicle body, characterized in that said metal element

consists of a sheet metal pressing formed with at least two identical lateral bent portions disposed on either side of a

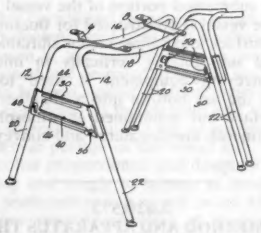


plane extending transversely to the armrest and adapted to be distorted about vertical axes.

3,620,567
CHAIR BASE GANGING FIXTURE

Philip J. Hendrickson, and Richard J. Resch, both of Green Bay, Wis., assignors to Krueger Metal Products, Inc., Green Bay, Wis.

Filed July 1, 1969, Ser. No. 838,153
Int. Cl. A47c *1/124*
U.S. Cl. 297—248 **1 Claim**

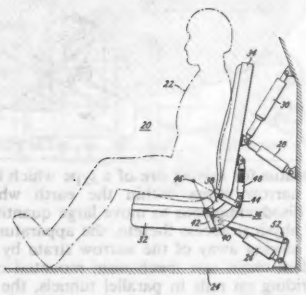


A chair base comprising front and rear legs is provided with braces connecting the rear with the front legs at each side of the chair base, the two braces being applied in mutually reversed positions. Each brace has a keyhole slot near one end and a headed peg near the other, the peg being detachably receivable into the complementary slot of a corresponding brace of the next adjacent chair base.

3,620,568
AIRCRAFT CREWSEAT

Elmore F. Morrow, Palm Beach Garden, Fla., assignor to The Boeing Company, Seattle, Wash.

Filed June 26, 1969, Ser. No. 836,724
Int. Cl. A47c *3/00, 1/02, 1/06*
U.S. Cl. 297—307 **3 Claims**

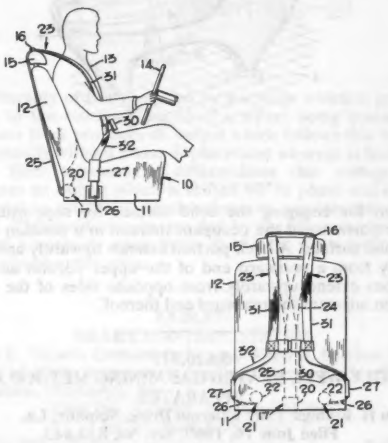


A seat structure which results in minimal movement between an occupant and the back of the seat when the seat is reclined. Members respectively extending from the seat back and a seat base are pivotally connected together by a pair of nonparallel links. Centerlines of the links intersect at a point essentially coincident with the pelvic point line of the occupant. An extensible link is connected to the seat base and the seat back for adjustably positioning the seat base and the seat back at a plurality of relative positions.

3,620,569
SEAT SAFETY HARNESS

Earl Mathis, c/o Aime Agency Co., 8301 Maryland Ave., St. Louis, Mo.

Filed Oct. 2, 1969, Ser. No. 863,088
Int. Cl. B60r *21/10;* **A47d** *15/00*
U.S. Cl. 297—388 **6 Claims**



A seat safety harness having a pair of shoulder-lap straps arranged to pass over the shoulders of the seat occupant, each strap having a first end adapted to be reeled onto the spring-loaded spool of a first retraction reel assembly of the inertia type mounted substantially behind the seat occupant, and having a second end attached to one of the attachment means located substantially below the lap of the seat occupant, at least one of the second ends of the straps being reeled onto a spring-loaded spool of a second retraction reel assembly of the inertia type that constitutes at least one of the attachment means. Quick-release buckles are fixed to the straps and are selectively connectable to provide two shoulder strap portions and a lap strap portion. The spring loading of the spool of the second retraction reel assembly is greater than the spring loading of the spool of the first retraction reel assembly so that the harness is self-adjusting when worn by the occupant and is self-storing when not in use. Strap guides slidably receive the straps between the second retraction reel assembly and the buckles so that the buckles engage the guides to limit reel takeup on the associated spool before the straps have unreeled from the spool of the first retraction reel assembly. In one embodiment, a pair of spring-loaded spools of the second retraction reel assembly are mounted, one on each side of the seat, the second strap ends extending down over opposite seat sides for connection to such spools. In another embodiment, the spools of the second retraction reel assembly are mounted at the rear of the seat, the second strap ends extending down between the seat portion and back portion of a seat for connection to the spools.

3,620,570
CHAIR-BOAT STRUCTURE

Jean B. Wilson, L-8 Lake Latawana, Lees Summit, Mo., and Dell Y. Angerer, 639 Romany Road, Kansas City, Mo.

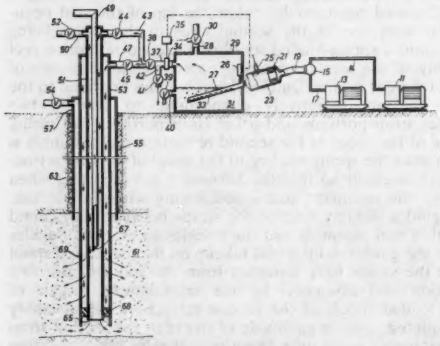
Filed Oct. 8, 1969, Ser. No. 864,775
Int. Cl. A47c *7/00, 7/20;* **B63c** *9/30*
U.S. Cl. 297—448 **4 Claims**

A buoyant structure adapted to be supported on a solid supporting surface and to float on water with an occupant

therein has an elongate buoyant upper portion with a generally horizontal concave upper surface adapted to support an occupant thereon with the buoyant structure being proportioned for stability while supporting the occupant. Support portions in the form of legs depend from the upper

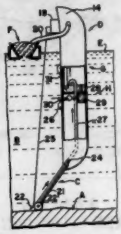
portion for engaging the solid surface for supporting the upper portion and the occupant thereon in a position above the solid surface. A back portion extends upwardly and rearwardly from a rearward end of the upper portion and arm portions extend upwardly from opposite sides of the upper portion adjacent the rearward end thereof.

3,620,571
SINGLE-WELL HEATED GAS MINING METHOD AND APPARATUS
Calvin H. Billings, 1901 Palermo Drive, Sulphur, La.
Filed June 16, 1969, Ser. No. 833,443
Int. Cl. E21b *43/24*; E21c *41/14*
U.S. Cl. 299—6 **13 Claims**



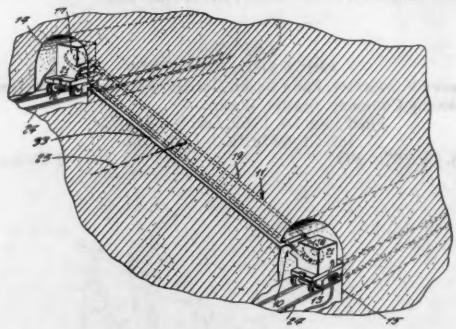
A mineral recovery method useful for mining liquefiable minerals, e.g., sulfur, involves the injection of hot gas, preferably with steam, through a series of concentric injection tubes which penetrate to the bottom of the mineral formation, and purging connate water from the vicinity of the tubes penetrating the formation by injection of such hot gas into the formation. The hot gas flow from the lowermost injection port is then stopped and hot gas flow is continued into the formation from upper injection ports, about 3 to 5 feet above the lower ports. The melted mineral collects as a pool in the vicinity of the lower injection ports and is pumped or air-lifted to the surface by conventional means and is maintained in a fused state by the heat of inflowing gas.

3,620,572
SEA MINING VESSEL
Manfred G. Krutein, General Dynamics Boat Div., Marine Technology Center, P.O. Box 911, San Diego, Calif.
Division of Ser. No. 461,785, June 7, 1965, Pat. No. 3,438,142
Filed Apr. 22, 1968, Ser. No. 723,191
Int. Cl. E02f *7/06*
U.S. Cl. 299—8 **6 Claims**



A sea mining vessel is disclosed wherein desired minerals lying at the sea bottom are first conveyed from the sea bottom to the submersed portion of an elongate vessel floating substantially vertically in the sea and then conveyed vertically from the submersed portion of the vessel to the surface of the sea. The vessel is constructed for floating horizontally on the ocean surface and ballast means shiftable for positioning the vessel substantially vertically in mining position. Hydraulic conveying equipment is used to convey the minerals from the sea bottom into a chamber in the vessel below the surface but maintained at atmospheric pressure and wherein minerals are dewatered and conveyed to the surface.

3,620,573
MINING METHOD AND APPARATUS THEREFOR
Desmond De Villiers Oxford, 33 New Forest Road, Forest Town, Johannesburg, South Africa
Filed Apr. 10, 1969, Ser. No. 815,098
Int. Cl. E21c *47/08*
U.S. Cl. 299—35 **3 Claims**



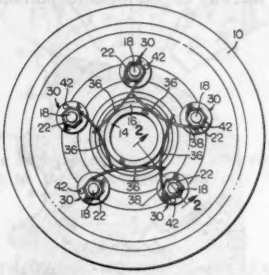
An apparatus for mining ore of a type which is located in relatively narrow strata within the earth whereby it is profitably disadvantageous to move large quantities of earth so to gain physical access thereto, the apparatus comprising means for sawing away of the narrow strata by a flat elongated endless chain saw mechanism mounted on a pair of carriages riding on rails in parallel tunnels, the mechanism having a thickness of approximately the thickness of the ore-bearing strata and the chain saw extending transversely between the tunnels wherein the ground material is sluiced into the tunnels and a pumping station provided to transport the material to the surface.

3,620,574

LUG LOCK

Paul D. Cox, Ridgeville, Ind., and Joseph J. Matchett, Dunkirk, Ind., assignor to said Matchett to said Cox

Filed Apr. 23, 1969, Ser. No. 818,753
Int. Cl. B60b 3/16
U.S. Cl. 301—9 DN 2 Claims



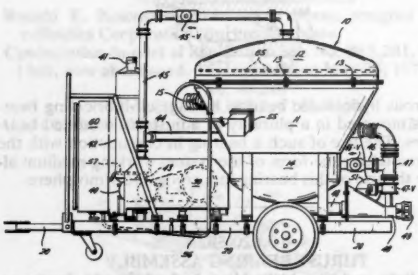
For use with a lug utilized to secure a wheel rim to a wheel hub, means for locking the lug against rotation in a direction tending to loosen it, the locking means comprising an element proportioned and designed to engage such a lug in such a manner as to be held against rotation relative thereto, and spring means connected to the element and arranged, when the element is so engaging such a lug, to engage an abutment, such as the sleever portion of the wheel hub. The preferred element is a collar proportioned and designed to slip axially over such a lug and snugly to engage at least one flat side thereof. The preferred spring means is an elongated, stiff, wirelike member securely attached, at its proximal end, to the element, the distal end portion of the member being arranged to engage the abutment.

3,620,575

PARTICULATE-CONVEYING APPARATUS

Donald J. McIver, and Russell D. McClaid, Jr., both of Houston, Tex., assignors to Keystone Valve Corporation, Houston, Tex.

Filed Sept. 5, 1969, Ser. No. 855,655
Int. Cl. B65g 53/40
U.S. Cl. 302—53 4 Claims



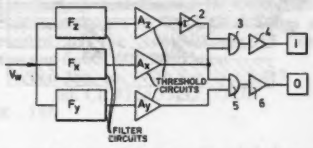
A system for (1) removal of particulate material from a supply area or container and filling a storage vessel, and (2) for discharging such material from the storage vessel into a supply line. Changing from cycle No. 1 to cycle No. 2 is effected by virtue of a reversible motor.

3,620,576

ELECTRONIC CONTROL OF VEHICLE BRAKE SYSTEM

Heinz Wehde, Heidelberg; Kurt Schindler, Nussloch; Joachim Rogge, Monchzell, and Armin Czinczel, Heidelberg, all of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed July 28, 1969, Ser. No. 845,418
Claims priority, application Germany, July 27, 1968, P 17 80 062.3
Int. Cl. B60t 8/08, 8/12
U.S. Cl. 303—21 BE 12 Claims



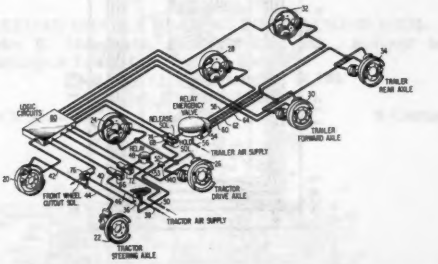
A plurality of filters are fed by a voltage which is proportional to the rotational speed of a wheel being braked. At least one filter produces an output which follows this voltage substantially without phase displacement whereas at least one other filter substantially differentiates this voltage and produces an output which is shifted 90° in phase and is proportional to rotational deceleration and acceleration of the wheel. Threshold circuits are fed by the filter outputs and control a normally open brake fluid inlet valve and a normally closed outlet valve.

3,620,577

BRAKE CONTROL SYSTEM

James C. Neisch, Orchard Lake, and Alton B. Holmes, Troy, both of Mich., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Dec. 9, 1969, Ser. No. 883,407
Int. Cl. B60t 8/08, 8/10
U.S. Cl. 303—21 EB 5 Claims



An electronic antiskid vehicle brake control system in which a pulse signal indicating the speed of one or more rear vehicle wheels is constantly compared to a reference pulse signal indicating the speed of the front vehicle wheels and a control signal is generated upon detection of a predetermined velocity differential. The control signal modulates the braking effort at the rear wheels. The front wheel brakes are released if they lock during brake application to permit the front wheels to regain speed to reestablish the reference signal and preserve steerability of the vehicle. When applied to a tractor-trailer combination the control system is automatically made compatible with a variety of trailer brake configurations.

3,620,578

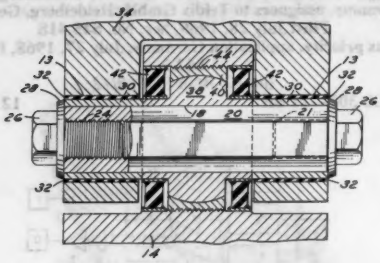
METHOD OF RETAINING INNER RACE OF BEARING FOR LUBRICATED PIN TRACK

Joseph O. Fix, Utica, Mich., assignor to the United States of America as represented by the Secretary of the Army

Filed Nov. 26, 1969, Ser. No. 880,264
Int. Cl. B62d 55/28
U.S. Cl. 305—11 8 Claims

Means for retaining an inner race for the bearing of a lubricated pin track. The inner race of the bearing is retained

on a polygonal or splined pin by a sleeve, which in turn is stacked in place by bolts in the ends of the pin. The bearing



member is sealed therein against foreign matter and provides a tight connection for its inner race, whereby the track can be separated without breaking into the sealed bearing area.

3,620,579

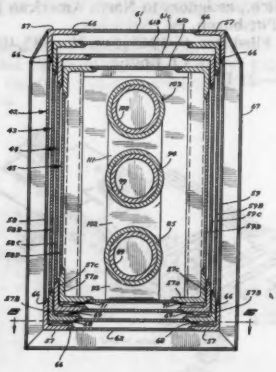
EXTENSIBLE BOOM ASSEMBLY

Archer W. Brown, Minneapolis; James L. Montgomery, St. Paul, and Lorraine V. Erkenbrack, St. Paul, all of Minn., assignors to American Hoist & Derrick Company, Saint Paul, Minn.

Filed June 13, 1969, Ser. No. 833,079

Int. Cl. F16c *23/00;* **B66c** *23/04*

U.S. Cl. 308—3 **25 Claims**



A truck-mounted boom assembly having a plurality of telescopic boom sections. Each boom section has right angle corner members secured to top, bottom and sideplates. Rockable friction pads slidably associated with adjacent corner sections mount the boom sections for movement relative to each other. A plurality of fluid pressure cylinder units located within the boom assembly are operable to selectively extend and contract the boom assembly by moving the boom sections relative to each other.

3,620,580

ROCK DRILL WITH INCREASED BEARING LIFE

Robert A. Cunningham, Bellaire, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Aug. 3, 1970, Ser. No. 60,372

Int. Cl. F16c *19/14, 21/00*

U.S. Cl. 308—8.2 **15 Claims**

The invention is applicable to all types of rock drills in which a rolling cutter is rotatably mounted on a fixed shaft member with an interposed ball bearing, and is especially useful in the newer rock bits provided with a lubricant system and a highly effective seal. Heretofore the ball bearing has served as a means for transmitting loads from cutter to shaft, including both radial loads and axial loads. The inventor has modified the bearing structure in such a way that at least outward thrust loads and preferably radial loads as well no longer pass through the balls, i.e., from the raceway of the cone through the balls to the corresponding raceway on the bearing pin. This is accomplished by relieving or deepening either or both raceways, preferably in a nonuniform fashion so that the deepest relief is in the outboard portion of the bearing pin raceway or the inboard portion of the cone

raceway, or both. One or more pairs of transversely extending friction bearing surfaces are disposed on the pair of members to absorb such thrust.

The important effect of this improvement is the reduction or elimination of spalling of the ball raceways, thus eliminating metal particles that otherwise could find their way between the confronting surfaces of other bearing members, where they are likely to wreck havoc. The overall effect is to increase the life of the bearing, making it last as long as the cutting structure of the bit.

3,620,581

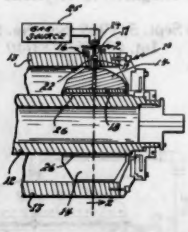
POROUS HYDROSTATIC BEARING

Stanley Heller, Philadelphia, and Wilbur Shapiro, Huntington Valley, both of Pa., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Oct. 12, 1970, Ser. No. 79,785

Int. Cl. F16c *17/16*

U.S. Cl. 308—9 **10 Claims**



A porous hydrostatic bearing having self-lubricating bearing pads mounted in a plurality of adjustably mounted bearing shoes. The use of such a bearing in conjunction with the gas source taking the form of the system working medium allows for the use of this bearing in a cryogenic atmosphere.

3,620,582

THRUST BEARING ASSEMBLY

Hiroshi Sato, and Hisashi Toshima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 14, 1970, Ser. No. 54,810

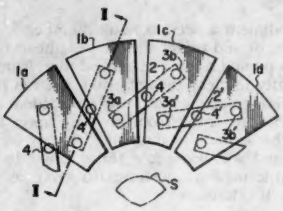
Claims priority, application Japan, July 14, 1969, 44/55111

Int. Cl. F16c *17/06*

U.S. Cl. 308—160 **12 Claims**

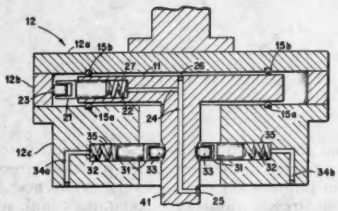
A thrust-bearing assembly having a plurality of adjacent bearing shoe segments supported such that when a load is added concentrically on one bearing shoe segment, the load is automatically divided among and received on adjacent

bearing shoe segments positioned on both sides of said one bearing shoe segment through seesaw action of spring plates



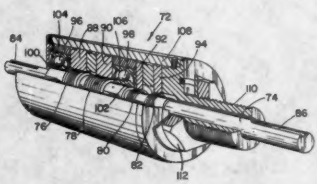
supporting the bearing shoe segments, whereby oil cut and overheat due to the concentric load can effectively be prevented.

3,620,583
CONTROLLED-MOTION COMPENSATOR
Thomas J. Koprowski, Northridge, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed Sept. 22, 1970, Ser. No. 74,339
Int. Cl. F16c *27/00*
U.S. Cl. 308—184 **5 Claims**



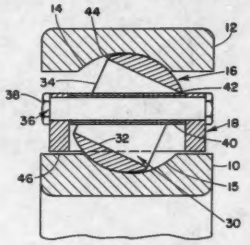
A system for coupling a pair of independent bodies and controllably compensating relative motion therebetween comprising a first coupling element defining a cylindrical socket and a second coupling element defining a disk with a tongue extending therefrom, said second coupling element disposed within said first coupling element, and hydraulic means acting between the coupling elements for controlling the stiffness of coupling therebetween.

3,620,584
MAGNETIC FLUID SEALS
Ronald E. Rosensweig, Lexington, Mass., assignor to Ferrofluidics Corporation, Burlington, Mass.
Continuation-in-part of application Ser. No. 865,281, Oct. 10, 1969, now abandoned. This application May 25, 1970, Ser. No. 40,246
Int. Cl. F16c *33/82*; **F16k** *41/00*
U.S. Cl. 308—187.1 **21 Claims**



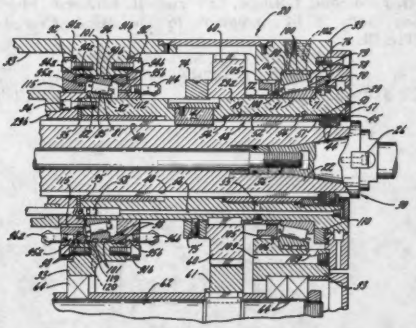
A modular magnetic fluid seal which comprises an outer ring and an inner ring within the outer ring and concentrically aligned therewith. The inner ring is spaced apart from the outer ring and secured thereto in a movable manner. Disposed between the rings and secured to the outer ring is a magnet. Adjacent to the magnet are pole pieces which define gaps with the inner ring. A magnetic fluid is captured in the gaps. The modular seal is inserted as a unit between surfaces such as a rotating shaft and a sleeve or collar. The inner ring is secured about the shaft in a fluidtight manner while the outer ring is secured in a fluidtight manner to the sleeve to provide a leakproof seal which may transmit rotary motion.

3,620,585
HIGH-SPEED ROLLING ELEMENT BEARING
William J. Anderson, and Harold H. Coe, both of North Olmsted, Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Jan. 16, 1970, Ser. No. 3,417
Int. Cl. F16c *33/32*, *33/38*
U.S. Cl. 308—195 **3 Claims**



Holes through rolling elements in a bearing reduce the mass. A cage-mounted pin and rotatable tube thereon through each hole maintains the rolling element in the optimum position.

3,620,586
PRELOAD SPINDLE BEARING FOR MACHINE TOOL
Charles R. Maastricht, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.
Filed Feb. 12, 1970, Ser. No. 10,740
Int. Cl. F16c *35/06*
U.S. Cl. 308—207 A **8 Claims**



A spindle mounting for a machine tool adapted to apply a predetermined light preload to the spindle bearings during high-speed operation and a predetermined higher preload during low-speed operation. The preload mechanism includes a pair of axially aligned hydraulically actuated pistons disposed on opposite sides of one of the outer bearing races. The pistons have a relatively narrow annular shape and do not extend radially outward substantially beyond the bearing, thereby minimizing the headstock space required. The outer periphery of each spindle bearing is formed with annular grooves through which a cooling fluid may be circulated for

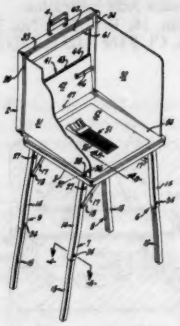
more efficient cooling of the bearings. Such cooling grooves also permit the bearings to be directly mounted in the headstock housing without containment in an intermediate cooling sleeve, thereby providing more accurate spindle support.

3,620,587

PORTABLE SELF-CONTAINED VOTING BOOTH

John E. Ahmann, Morgan Hill, Calif., assignor to Computer Electron Systems, Inc., San Francisco, Calif.

Filed Dec. 18, 1969, Ser. No. 886,061
Int. Cl. A47b *77/08, 43/00;* **E04b** *1/346*
U.S. Cl. 312—223 **10 Claims**



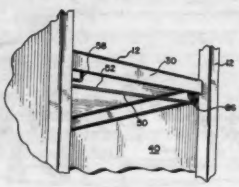
A self-contained voting booth which may be collapsed and enclosed entirely within and upon a compact carrying case for ease of transportation and storage. Integral extensible and retractable leg structures permit positioning of the booth at any desired location when extended yet do not interfere when retracted with support of the booth on another supporting surface when use of the leg structures is not desirable. The case structure includes retractable sidewall privacy panels and a light source integral therewith, supporting means for permitting use of automatic voting devices therein when punchcard-type ballots are to be employed, and an integral shelf structure providing a writing surface when write-in type ballots are to be employed.

3,620,588

DOOR CLOSURE FOR SHELVING

Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, both of Ill., assignors to The Hirsh Company, Skokie, Ill.

Filed Apr. 6, 1970, Ser. No. 25,975
Int. Cl. A47b *88/06*
U.S. Cl. 312—323 **5 Claims**



A lightweight pull slide door construction for shelving which is either transparent or opaque and is notched at its upper corners to slide on a horizontally inwardly offset rod hanger that extends front to back within the opening defined by the front posts of the shelving. A front opening hook at each corner slidably engages the offset portions of the hanger in guided relationship and the hook portion pivotally engages the offsetting portion of the hanger at the front of the shelving, whereby a top portion of the door pivots forwardly behind the depending portion of the depending flange of the upper shelf, the notch accommodates the shelf corner securement, and the hooks determine the "hang" and levelness of the door when closed. The doors can be released and removed when in the open position through the space above the hanger and within the depending flanges of the upper shelf.

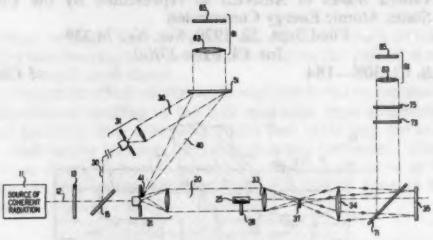
In one embodiment a second hook member is provided extending inside of and under the hanger ahead of the tip end of the front opening hook and spaced therefrom on its inner side sufficiently to clear the offsetting portion of the hanger so that the sliding door, which rests at its side edges upon the hanger will be prevented from pivoting upon the offsetting portion of the hanger against the bottom of an adjacent upper shelf and will provide a thrust point to stabilize the door in its intermediate positions to serve as a temporary horizontal shelf extension.

3,620,589

INTERFEROMETRY OF TRANSPARENT OBJECTS

Thomas Dixon Dudderar, Madison, and Richard O'Regan, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 8, 1970, Ser. No. 70,409
Int. Cl. G02b *27/22;* **G01b** *11/18*
U.S. Cl. 350—3.5 **18 Claims**



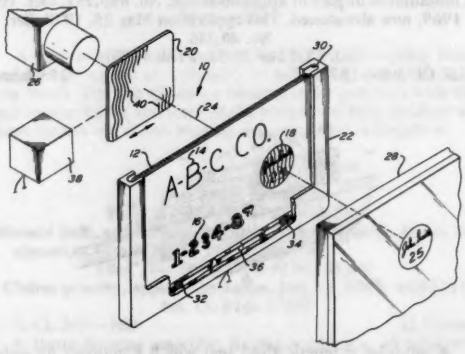
A method and apparatus have been devised for separating information related to the sums of the principal stresses in an object from information related to the differences between the principal stresses. Illustrative apparatus comprises means for rotating by approximately 90° the electric vector of a beam of radiation from the object, means for imaging this radiation to point-for-point coincidence with the object and means for interfering this beam from the object with a second beam that is a reference. Preferably, this second beam is formed by holographic techniques.

3,620,590

HOLOGRAPHIC METHOD AND APPARATUS FOR INFORMATION STORAGE AND RETRIEVAL

Ronald C. Barker, Weston, Mass., assignor to Applied Laser Technology, Incorporated, Wilmington, Del.

Filed May 27, 1969, Ser. No. 828,184
Int. Cl. G02b *27/22;* **G09f** *3/03*
U.S. Cl. 350—3.5 **11 Claims**



A holographic method and apparatus for storing and retrieving information only by authorized persons, particu-

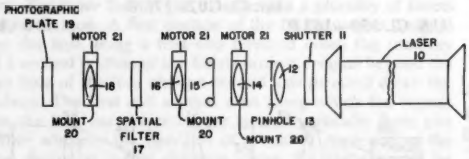
larly used for identifying the bearer of a record of such information, comprises storing the information on a record medium as a hologram, scrambling the image of the information on the hologram so that it cannot be recreated except by authorized persons using a master code, and then recreating the scrambled holographic image using apparatus that eliminates the effect of the master code. The information is recreated and displayed using apparatus for displaying holograms which further includes a master code hologram that is reciprocated across the optical axis of the display apparatus so as to eliminate the scrambling effect of the master code on the hologram. The master code may consist of a series of parallel randomly undulating lines.

3,620,591

OPTICAL PROCESSING OF DATA

Emmet D. Riggs, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed July 22, 1969, Ser. No. 843,538
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 **3 Claims**



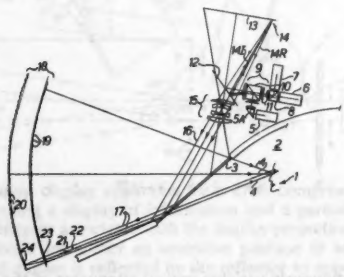
A method and apparatus for optically processing seismic or other data by spatial filtering in order to discriminate against optical noise and enhance recoverable information. Optical elements acting on the seismic signals are mounted in special assemblies and rotated at different angular velocities with respect to one another. A series of partial exposures are made of the output information at selected time intervals and added to give a composite exposure. Also disclosed is a preferred process for preparing spatial filters by photographic reduction.

3,620,592

OPTICAL DISPLAY SYSTEMS

Michael Harold Freeman, Denbigh, Wales, assignor to Pilkington Perkin-Elmer Limited, Liverpool, England

Filed June 29, 1970, Ser. No. 50,836
Claims priority, application Great Britain, July 3, 1969, 33,601/69
Int. Cl. G02b *23/00, 27/10*
U.S. Cl. 350—9 **14 Claims**



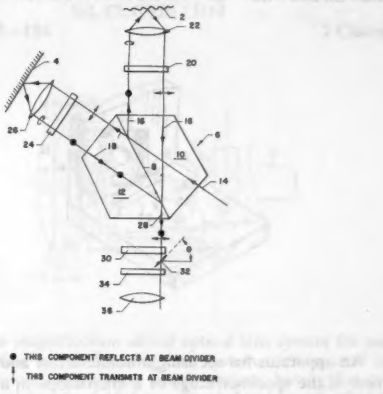
Collimated light carrying visual information is projected via a partial reflector on to a reflex-reflector which returns the light to the partial reflector for viewing by an observer who sees an image of the visual information at infinity. A flight simulator and a head-up display apparatus employing this system are described.

3,620,593

METHOD OF SURFACE INTERFERENCE MICROSCOPY

Robert B. Tackaberry, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 2, 1970, Ser. No. 7,918
Int. Cl. G02b *27/28*
U.S. Cl. 350—12 **3 Claims**



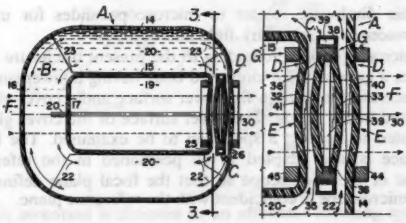
An incident beam of natural light is divided into two beams of linear polarized light, their polarizations being mutually perpendicular. One beam is directed to a specimen surface and the other to a reference surface. Upon reflection from their respective surfaces, the beams are recombined and analyzed. The resultant of this recombined beam is a linear polarized beam having a certain orientation which is a function of the difference in optical path of the two beams. This optical path difference relates to the magnitude of imperfections of the specimen surface under observation.

3,620,594

OPTICAL STABILIZER HAVING HYDRAULICALLY MOVED LIGHT-DEFLECTING LENSES

William E. Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Oakland, Calif.

Filed June 23, 1969, Ser. No. 835,680
Int. Cl. G02b *23/00*
U.S. Cl. 350—16 **22 Claims**



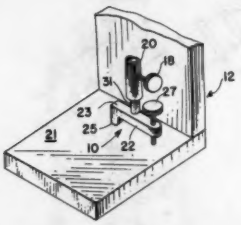
An optical stabilizer consisting of at least one neutrally buoyant lens supported in a transparent fluid bath along the optical path of a lens system. The fluid bath is enclosed within a casing, the casing being transparent at the points where it intercepts the optic path. The bath is provided with a circuitous path and its inertia moves the lens across the optical path to deflect the light passing through the lens equal and opposite to the accidental angular motion of a lens system.

3,620,595

ABSOLUTE FOCUS LOCK FOR MICROSCOPES

Russell W. Loop, Bartlett, Ill.; Max Tongier, Jr., Williamsburg, and Clarence D. Cone, Jr., Yorktown, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Mar. 5, 1970, Ser. No. 16,808
Int. Cl. G02b 21/26
U.S. Cl. 350—86 3 Claims



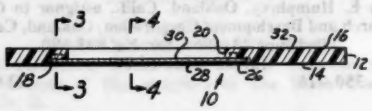
An apparatus for securing absolute arrest and immobilization of the specimen stage of a microscope in a preset state of focus to thereby preserve the focus over an extended period of time.

3,620,596

MICROSCOPE SLIDES

Gerald F. Binnings, Arcadia, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Continuation of application Ser. No. 732,341, May 27, 1968, now abandoned. This application Sept. 18, 1970, Ser. No. 73,654
Int. Cl. G02b 21/34
U.S. Cl. 350—95 5 Claims



This disclosure relates to microscope slides for use in microscopes such as dark-field microscopes.
A microscope slide according to the present disclosure comprises a generally flat elongated body having a lower surface. A recess is provided in the lower surface and a cover glass is located in the recess. The lower surface of the cover glass is adapted to support a specimen to be examined. The lower surface is also adapted to be positioned in the reference plane of the microscope so that the focal plane defined by the microscope is coincident with the reference plane.

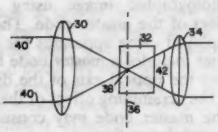
3,620,597

METHOD AND APPARATUS FOR NONLINEAR OPTICAL LIMITING

Jacob Schwartz, Arlington, and Charles S. Naiman, Brookline, both of Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed July 15, 1968, Ser. No. 744,920
Int. Cl. G02f 1/36; G02b 9/00; G02c 7/10
U.S. Cl. 350—160 15 Claims

Described herein is a method and apparatus for the nonlinear limiting of coherent radiant energy based upon the discovery of materials exhibiting nonlinear absorption. This discovery provides a method upon which the operation of apparatus for limiting, detecting and modulating coherent radiant energy is based.

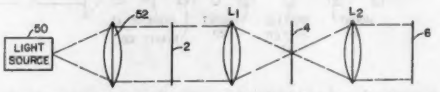


3,620,598

SPATIAL FREQUENCY DIVERSITY FOR COHERENT OPTICAL PROCESSING

Gerald B. Brandt, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1970, Ser. No. 17,195
Int. Cl. G02b 27/38
U.S. Cl. 350—162 R 6 Claims



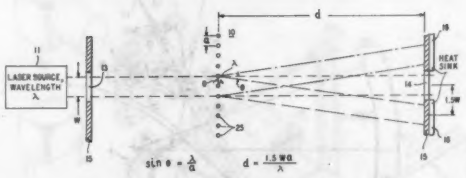
Apparatus for improving the quality of an input transparency used in an optical processor. The input transparency is illuminated with coherent light which has been passed through a fine grating or grid. The grid causes the transparency to be broken up into a plurality of diffraction patterns. When the image is reconstructed in the output plane, there is a marked decrease in the localization of reflection noise which would otherwise have been caused by the system.

3,620,599

NONPOLARIZING WIRE-GRID DIFFRACTION-TYPE OPTICAL ATTENUATOR

Arthur Ashkin, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 30, 1969, Ser. No. 837,716
Int. Cl. G02b 5/18, 27/38
U.S. Cl. 350—162 6 Claims



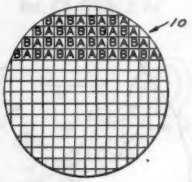
A continuously variable optical attenuator of the wire-grid type is disclosed in which the wire diameter and the spacings therebetween are from one to three orders of magnitude greater than the wavelength of the optical radiation to be attenuated and which operates upon principles of diffraction. Even at high attenuation factors, the attenuation does not depend significantly upon the polarization of the input optical radiation.

3,620,600

LENS WITH FACETS FOR PROJECTING LIGHT ALONG DIFFERENT AXES

Victor L. Lindberg, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 30, 1970, Ser. No. 33,446
Int. Cl. G02b 27/00
U.S. Cl. 350—167 2 Claims



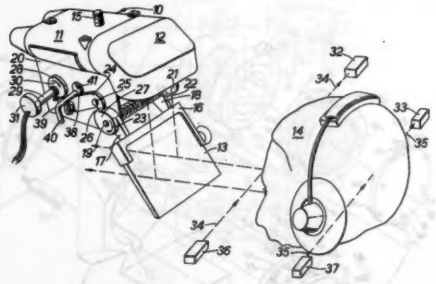
An improved lens for a signal device which projects a signal along a roadway is constructed as follows. A light-transmitting member is provided which has inner and outer faces. The inner face of the member has a plurality of facets formed thereon. A first portion of the facets project a signal from the lens along a first axis directed down the roadway and a second portion of the facets project a signal beyond the outer face of the lens along a second axis directed down the roadway. The first and second axes along which the signals from the lens are projected are spaced vertically from one another whereby the operator of a vehicle approaching the signal device at a first distance above the highway will be warned by the signal projected along the first axis and the operator of a motor vehicle positioned a second distance above the highway will be warned by the signal projected along the second axis.

3,620,601

HEAD-UP DISPLAY APPARATUS

Leonard Cyril Waghorn, Stoneleigh, and Peter Raymond Turner, Woldingham, both of England, assignors to Smiths Industries Limited, London, England, by said Waghorn

Filed Oct. 23, 1970, Ser. No. 83,374
Claims priority, application Great Britain, Oct. 24, 1969, 52,164/69
Int. Cl. G02b 27/14
U.S. Cl. 350—174 8 Claims



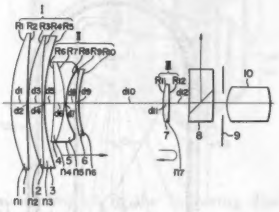
A head-up display apparatus for a craft comprises means for projecting a display of information and a partially transparent reflector associated with the display projection means. The reflector has either an operative position in which the projected display is reflected by the reflector to appear in an observer's line of sight through the reflector or a retracted position out of the observer's line of sight. The apparatus also includes means for displacing the reflector from the operative position to the retracted position, and means sensitive to radiant energy, the reflector displacement means being controlled in accordance with the radiant energy sensed by the radiation-sensitive means to effect the displacement of the reflector in response to change in radiation sensed by the radiation-sensitive means.

3,620,602

VARIABLE-MAGNIFICATION AFOCAL OPTICAL LENS SYSTEM

Motoaki Kawazu, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 60,698
Claims priority, application Japan, Aug. 2, 1969, 44/61216
Int. Cl. G02b 15/14
U.S. Cl. 350—184 2 Claims



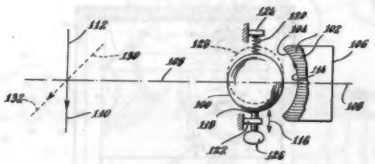
A variable-magnification afocal optical lens system for use in combination with a focusing lens system such as used in small motion-picture cameras and projectors, having, for example, a focal length of 15.5 mm., back focal length of 11.0 mm., f-number of 1.8 and maximum image height of 3.5 mm., to permit varying the focal length from 10 to 30 mm. with a back focal length of 11.0 mm. and f-number of 1.8. The afocal system comprises an array of seven elements in three groups with the second group consisting of cemented positive and negative meniscus lenses and an individual negative meniscus lens, having strong diverging power with a compound focal length of −18.88 mm., so that the image errors of the first group are well compensated and the image errors of the whole system are minimized upon shifting, thus permitting the system to be made as compact as a conventional afocal lens system.

3,620,603

OFFCENTER FOCUSING SYSTEM

George R. White, Rochester, N.Y., and Gordon R. Griffin, Claremont, Calif., assignors to Xerox Corporation, Stamford, Conn.

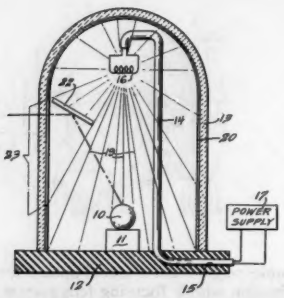
Filed July 6, 1970, Ser. No. 52,494
Int. Cl. G02b 7/02, 5/14, 5/10
U.S. Cl. 350—247 15 Claims



This invention is directed to an offcenter focusing system including a lens which forms a spherical image from an objective plane and with a spherical surface positioned adjacent to the lens so as to receive the spherical image. Focusing in the system of the present invention is accomplished by providing a relative movement between the lens and the spherical surface in a direction away from the common axis of the lens and the spherical surface so as to produce a tilting of the objective plane. The lens may be either refractive or reflective and one example of the invention using a refractive lens is a ball lens in conjunction with a bundle of optically conducting fibers, which bundle forms a spherical surface and with the lens and the bundle of fibers initially on a com-

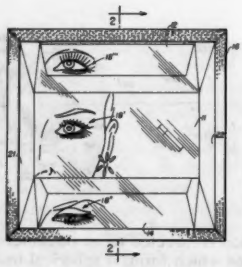
mon axis and with the relative movement off of this common axis to produce a tilting of the objective plane.

3,620,604
METALLIZING CHAMBER VIEWING SYSTEM
Thomas H. Benham, Joliet IL, assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed Jan. 6, 1970, Ser. No. 1,004
Int. Cl. G02b *5/08*
U.S. Cl. 350—301 **3 Claims**



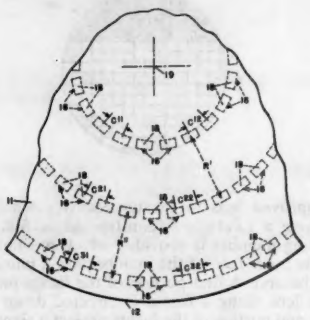
A mirror is placed within a metallizing chamber having a transparent viewing port in a position so as to shield the viewing port from the metal source. The mirror is also positioned to reflect a view of the object being metallized through the viewing port. If required, a second mirror may be used to reflect a view of the object to the first mirror.

3,620,605
EYE MIRROR
James D. Clark, Berkeley, Calif., assignor to Paul of Hawaii, Inc.
Continuation of application Ser. No. 771,013, Oct. 28, 1968, now abandoned. This application Mar. 5, 1971, Ser. No. 121,595
Int. Cl. G02b *5/08*
U.S. Cl. 350—305 **5 Claims**



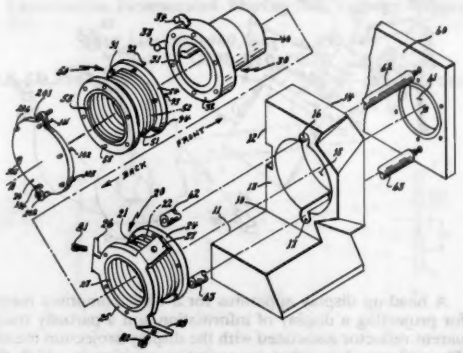
An optical device for viewing the eye of an observer simultaneously from three different vertical angles for the purpose of applying cosmetics in which an upper and lower mirror are arranged at an angle of from 98° to 122° with a vertical mirror, which mirror arrangement is mounted in an open end container incorporating a means for illuminating the eye area.

3,620,606
OPTICAL SYSTEM SUPPORT APPARATUS
Hubert F. A. Tschunko, Milton, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Continuation-in-part of application Ser. No. 712,100, Mar. 11, 1968, now abandoned. This application May 13, 1970, Ser. No. 36,819
Int. Cl. G02b *5/08*
U.S. Cl. 350—310 **10 Claims**



An optical mirror support system is disclosed having a mirror supported by a plurality of supporting elements arranged along discrete contact regions so as to deform the mirror reflective surface in a manner producing a deformation pattern which qualitatively causes a diffraction pattern by the optical aperture having an idealized or optimized image quality. A preferred or optimized ratio of the distances between adjacent families of support elements and the distance between adjacent support elements of the same family, has been found.

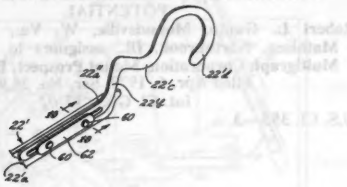
3,620,607
VACUUM COMPENSATED MIRROR MOUNT ASSEMBLY
Raymond H. Griest, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force
Filed Nov. 5, 1970, Ser. No. 87,219
Int. Cl. G02b *5/08*
U.S. Cl. 350—310 **1 Claim**



A mirror mount assembly for a laser mirror. The assembly includes bellows, internal of which the mirror is supported. The bellows, and associated components, are mounted on a stable base. The assembly provides for compensation for vacuum forces; accomplishes isolation of the mirror from mechanical vibrations; and permits cooling of the mirror. In

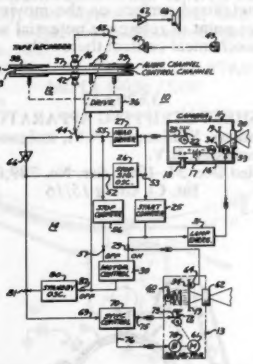
addition, the assembly allows ready accessibility to the mirror.

3,620,608
EYEGLASS ASSEMBLY
Jeannette Davis, 1320 Midvale Ave., Los Angeles, Calif.
Continuation-in-part of application Ser. No. 762,799, Sept. 26, 1968, now abandoned. This application Apr. 6, 1970, Ser. No. 25,922
Int. Cl. G02c 5/14
U.S. Cl. 351—111 5 Claims



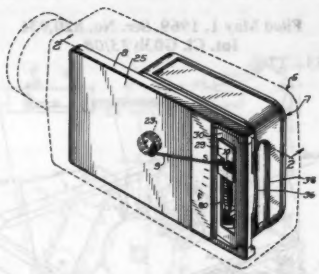
An improved eyeglass assembly is provided in the form, for example, of a pair of spectacles having a resilient frame which may be composed of a light resilient plastic, and which includes side bows which are shaped and configured so that the assembly may be securely and firmly supported against the side of the head of the wearer and out of engagement with the bridge of the wearer's nose. In one embodiment, the side bows are adjustable so as to fit different head sizes.

3,620,609
AUTOMATIC PROJECTOR-RECORDER SYNCHRONIZER
Robert S. John, Jr., Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed June 10, 1968, Ser. No. 735,731
Int. Cl. G03b 31/04, 31/06
U.S. Cl. 352—17 15 Claims



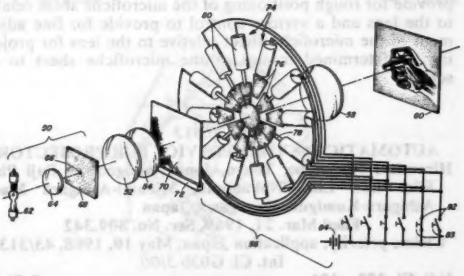
An apparatus which provides sound synchronized accompaniment for motion-picture projection. Upon the expiration of a predetermined time interval after the camera is actuated, a tape cassette recorder starts. Starting of the tape recorder causes a lamp to be energized thereby exposing a portion of the film to create a recorder start indication. Upon stopping of the camera, a stop burst is generated which is recorded upon the control track of the recorder the operation of which also terminates. Synchronization pulses generated by the camera are also recorded upon the control track. During projection, the exposed start indication areas upon the film are utilized to start the recorder the sync pulses maintain synchronization and the burst serves to stop the recorder.

3,620,610
FILM FOOTAGE INDICATOR
Richard K. Carlson, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Dec. 30, 1969, Ser. No. 889,276
Int. Cl. G03b 1/60
U.S. Cl. 352—172 9 Claims



The invention embraced in the following disclosure has reference to film footage indicators and consists of a bracket adapted to be rocked from operative to inoperative positions by the insertion of a film cartridge into a camera. Associated with the bracket is a sliding plate which is provided with a tooth in engagement with a driving threaded member. An opening in the sliding plate confines an indicator or pointer and motivates the same along the threaded member. A graduated scale marked S (start) and F (finish) shows the proportional or fractional amount of film exposed, from which by deduction the unexposed portion of film can be calculated. The threaded member has secured thereto a pinion which is driven one tooth at a time by a claw member moving in an elliptical orbit engaging and disengaging itself from the pinion. The claw member is cam actuated and is slidably connected to a pin element which results in the orbit referred to before.

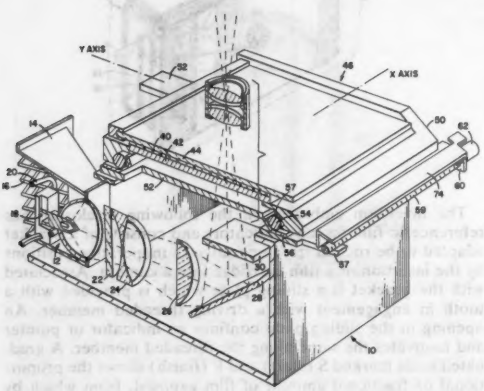
3,620,611
APPARATUS AND METHODS FOR DISPLAYING OR VIEWING EDUCATIONAL MATERIALS OR THE LIKE
George B. Parrent, Jr., Carlisle, and Peter F. Mueller, Concord, both of Mass., assignors to Technical Operations, Incorporated, Burlington, Mass.
Filed Feb. 15, 1968, Ser. No. 705,771
Int. Cl. G03b 21/14, 21/26
U.S. Cl. 353—20 1 Claim



This disclosure depicts apparatus and techniques for selectively retrieving one or a selected combination of images stored in additive superposition on a photostorage record. As an example of a useful implementation of the invention, there is disclosed an educational display device for use in instructing nurses, doctors, medical technicians, and so forth, on the human physiology. On a single record, images of a number of anatomical systems are recorded in additive superposition, the images being selectively retrievable at the option of the operator to enable the component systems to

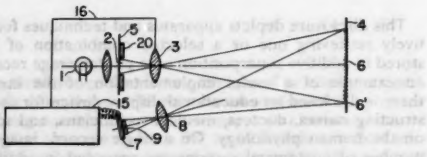
be viewed individually, or to be overlaid in selected combinations to show physiological or other relationships between the various systems.

3,620,612
MICROFICHE HANDLER
Mitchell C. Hopper, 2003 Suzanne Terrace N.W., Huntsville, Ala.
Filed May 1, 1969, Ser. No. 820,936
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 **9 Claims**



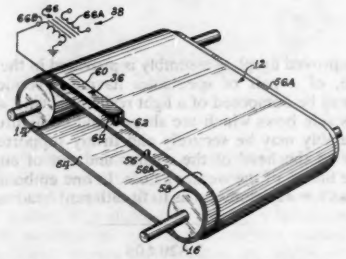
Mechanism for holding and positioning a microfiche film relative to a projection system including a lens and light source disposed for projecting the microfiche image on a screen. The holding and positioning mechanism includes a first support member disposed for support of a pair of transparent plates having the microfiche sheet positioned therebetween, and a second support member carried by the projection mechanism for support of said first support member. The first support member is slidably carried on the second support member for movement in a first direction and the second support member is slidably mounted in the frame of the projection mechanism for movement in a second direction which is normal to the direction of movement of the first support member. A control device includes an override mechanism which will provide a free-floating relation of the support members to the projection mechanism frame to provide for rough positioning of the microfiche sheet relative to the lens and a vernier control to provide for fine adjustment of the microfiche sheet relative to the lens for projecting predetermined frames of the microfiche sheet to the screen.

3,620,613
AUTOMATIC FOCUSING DEVICE FOR PROJECTORS
Hiromitsu Watanabe, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Nakanuma, Minami-Ashigara Machi, Ashigara-Kamigun, Kanagawa, Japan
Filed Mar. 21, 1969, Ser. No. 809,342
Claims priority, application Japan, May 10, 1968, 43/31329
Int. Cl. G03b *3/00*
U.S. Cl. 353—101 **5 Claims**



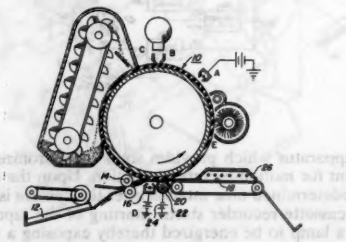
An image projected onto the projection screen by a projector is automatically focused by utilizing a photoconductive element which receives the light reflected from the projected screen. The photoconductive element is provided with a boundary to be in alignment with the boundary of the image of the screen to be projected with the projection image. The displacement of the boundary of the image of the screen out of the light received by the element, which automatically controls the focusing system of the projector by means of a servomotor or the like.

3,620,614
PHOTOELECTROSTATIC COPYING MACHINE WITH CORONA MEANS ESTABLISHING A REFERENCE POTENTIAL
Robert L. Gunto, Moundsville, W. Va., and Henry A. Mathisen, Northbrook, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
Filed Apr. 6, 1970, Ser. No. 25,967
Int. Cl. G03g *15/02*
U.S. Cl. 355—3 **7 Claims**



A moving, flexible belt type of copying machine in which the belt or loop is formed of an insulating base with an electrically conductive or metallized surface covered, except at the edges, by a photoconductive layer. The machine has charging, exposing, developing, and transferring stations some of which bias or apply a charge to the photoconductive layer. A corona discharge unit disposed adjacent the exposed edge of the metallized surface on the moving loop couples the surface to a point of reference potential and obviates the need for any mechanical contact therewith.

3,620,615
SHEET STRIPPING APPARATUS
Stewart W. Volkers, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Dec. 31, 1968, Ser. No. 789,030
Int. Cl. G03g *15/16*
U.S. Cl. 355—3 **6 Claims**



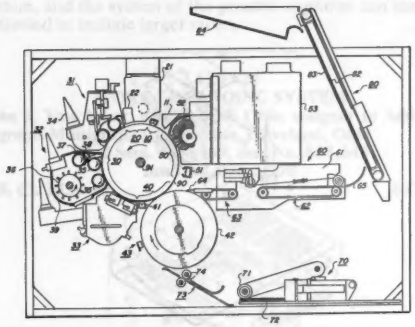
Apparatus for stripping a copy sheet electrostatically supporting a toner image from an oppositely charged xerographic surface. The apparatus includes an electrically biased roller slightly spaced from the copy sheet in the stripping zone to effect the stripping. Contact between the roller and copy sheet neutralizes the sheet. Alternately, the neutralization may be effected by a corona discharge device.

3,620,616

TRANSFER DRUM WITHDRAWAL APPARATUS

James R. Davidson, Rochester, and Paul R. Lagonegro, Henrietta, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,235
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 5 Claims



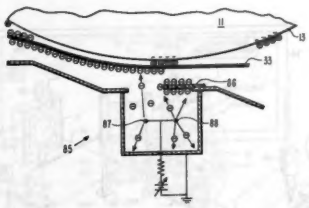
An apparatus for withdrawing a transfer drum from an electrostatic drum in a reproduction system when a copy sheet is misfed onto the surface of the transfer drum having a misfeed detector adjacent the transfer drum prior to the transfer station and an arm to pivot the main shaft of the transfer drum away from the electrostatic drum in response to a signal from the misfeed detector. When a misfeed occurs, the transfer drum is separated from the electrostatic drum to prevent the toner image on the electrostatic drum from transferring to the surface of the transfer drum.

3,620,617

ELECTROPHOTOGRAPHIC APPARATUS WITH IMPROVED TONER TRANSFER

Michael J. Kelly, and Myron F. Shlatz, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,073
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 8 Claims



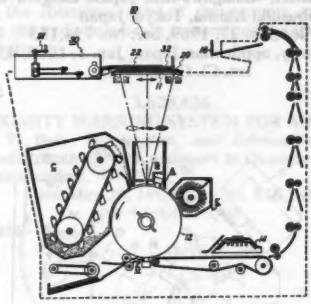
The invention concerns electrophotographic apparatus provided with an optical photoconductive (OPC) conveying means charged with an image pattern of toner and improved transfer means including an insulating transfer member for effecting a more positive transfer of toner from the OPC to a copy sheet. In one form, the additional transfer member is a Mylar* (*Trademark of Du Pont & Co.) flap partially covering the transfer corona station and, in another case, a nylon or Dacron* mesh covering the entire transfer station. A negative potential is established on the transfer corona wires to charge the paper for effecting transfer of toner and, at the same time, to charge the additional transfer member to repel the paper and insure a closer contact with the OPC material.

3,620,618

MULTIPLE INPUT COPYING APPARATUS

William T. White, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,711
Int. Cl. G03g *15/00*
U.S. Cl. 355—6 5 Claims



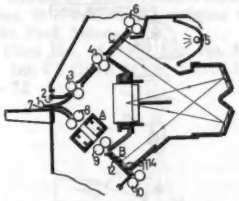
Apparatus for producing copy from simultaneously imaged multiple inputs including opaque card stock adapted to be removably positioned on the platen of a copying machine to present variable information as a composite image with a transparent document bearing fixed information. The apparatus comprises a platen on which the transparency bearing fixed information is supported, card handling means for advancing the opaque cards bearing other information in registration with a selected portion of the transparency along a first dimension and control means associated with said card handling means for moving said cards from a first to additional positions along the platen for projection with a selected portion along a second dimension of the transparency.

3,620,619

EXPOSURE WINDOW SYSTEM FOR ELECTROSTATIC COPIER

Sadashige Hayashi, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

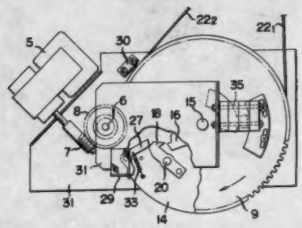
Filed June 24, 1970, Ser. No. 49,416
Claims priority, application Japan, July 8, 1969, 44/64698
Int. Cl. G03g *15/04*
U.S. Cl. 355—8 4 Claims



An exposure window system providing a path for continuously exposing copy paper which has been charged in a charging section to an image of the original through a slit while the copy paper is being guided through the path. Instead of disposing filaments for guiding the copy paper along a plane in the opening for receiving the image of the original, the exposure window comprises a first transparent glass plate supported parallel to a guide plate at a position proximate to an inlet of the original and a second transparent glass plate extending from the rear end of the first glass plate to an outlet. The end of the second glass plate near the inlet is slightly projected outward with respect to the guide plate. The inclination of the second glass plate reduces the area of the

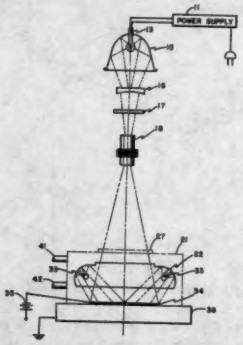
copy paper in contact with the glass plate and therefore prevents the copy paper from jamming the exposure path attributable to the electrostatic charge and moisture of the copy paper.

3,620,620
ORIGINAL HOLDER RECIPROCATING-TYPE DRIVING DEVICE FOR PHOTOCOPYING MACHINE
Shigehiro Komori, Kanagawa-ken, Japan, assignor to Canon Camera Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 27, 1969, Ser. No. 794,153
Claims priority, application Japan, Jan. 1, 1968, 43/6133
Int. Cl. G03b *27/62*
U.S. Cl. 355—8 **5 Claims**



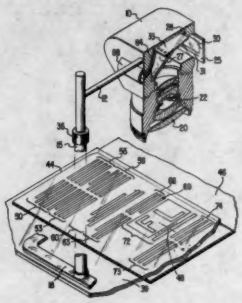
An original holder for photocopying machine on which the original is disposed for photocopying is driven to reciprocate in a predetermined stroke. In the forward stroke in one direction, the original disposed on the holder is copied to a photosensitive paper. At the end of the forward stroke, the movement of the original holder is switched to the return stroke in the opposite direction by means of interlocking clutch mechanisms to bring it back to the initial position. At the initial position, the original holder is stopped for replacement of the original and is ready to undertake the next succeeding photocopying step in the forward stroke.

3,620,621
EMULSION CONTROL
Ervin J. Rachwal, Framingham; Robert W. Marculewicz, Manchester, and Douglas B. Campbell, Natick, all of Mass., assignors to Matrographics, Inc., New York, N.Y.
Filed Feb. 12, 1969, Ser. No. 798,596
Int. Cl. G03b *27/76*
U.S. Cl. 355—30 **5 Claims**



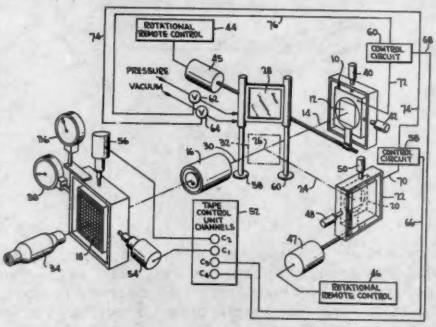
An emulsion control for use in making plates for printing. An emulsion is used for receiving a photographic image which has a given sensitivity, which can be increased by controlling the humidity and temperature of the environment surrounding the plate, the voltage on the plate, and the light surrounding the plate to the extent that a certain threshold is not exceeded. This permits low intensity photographic images to trigger a necessary chemical action to produce an image on the plate.

3,620,622
MICROPHOTOGRAPHIC RECORD AND METHOD
Norton Goodwin, 824 Connecticut Ave. N.W., Washington, D.C.
Filed June 18, 1968, Ser. No. 738,028
Int. Cl. G03b *27/32*
U.S. Cl. 355—43 **21 Claims**



A regular microphotographic record is produced from documents consisting in a multiplicity of regular and irregular graphic records by making an intermediate volume of photographic records and photographically collating the images therefrom. The intermediate volume has uniform graphic field storage areas in which graphic fields of uniform width are fixed and may be produced from document records having graphic fields of varying width by photographing such fields individually at the appropriate reduction ratio. This volume may contain marks which can be sensed to aid in the collating process.

3,620,623
OPTICAL SYSTEM FOR INTERMIXING DISSIMILAR STEP-AND-REPEAT PATTERNS
Robert B. Reams, Jr., Silver Spring, Md., and Charles H. Klute, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army
Filed Apr. 24, 1970, Ser. No. 31,633
Int. Cl. G03b *27/46*
U.S. Cl. 355—53 **20 Claims**



A step-and-repeat camera system for automatically intermixing dissimilar unit patterns on a photomask for use in the fabrication of solid-state electronic microcircuits. The system provides for the use of a number of different secondary unit patterns mounted in light boxes whose optic axes are directed towards reflecting means located along a principal optic axis. The reflecting means, which can take the form of

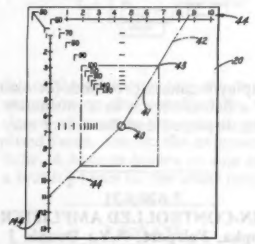
a number of different embodiments, are precisely aligned to reflect the desired secondary image towards a photosensitive plate that is successively stepped to each of its matrix positions before exposure. The entire system is automated by means of a numerical tape control unit that positions the photosensitive plate, positions the reflecting means and actuates the desired light box according to a preprogrammed tape. After the usual preliminary alignments, the different patterns can be mixed automatically in any desired manner on a single photosensitive plate. Several embodiments are disclosed, ranging from a two-pattern mix to a five-pattern system, and the system of the present invention can easily be extended to include larger mixes.

3,620,624

WORK ARRANGING SYSTEM

John J. Van Acker, Chesterland, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Sept. 16, 1969, Ser. No. 858,343
Int. Cl. G03b *27/58*
U.S. Cl. 355—61 **8 Claims**



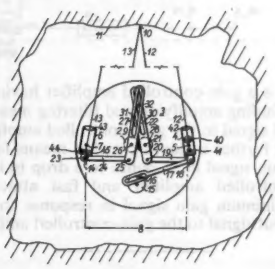
An autofocus camera with mechanical advancement and processing of photosensitive copy whereby the operator is unable to view the location of the image on the copy. A copyboard is marked with indicia and calibration scales for accurate placement of the image on the copy sheet.

3,620,625

DEVICE FOR MEASURING A TUNNEL SECTION

Ruben Valdemar Tegholm, Johanneshov, Sweden, assignor to Atlas Copco AB, Nacka, Sweden

Filed Nov. 4, 1968, Ser. No. 773,242
Claims priority, application Sweden, Nov. 3, 1967, 15105/67
Int. Cl. G01c *3/00*
U.S. Cl. 356—1 **8 Claims**



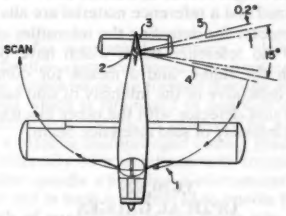
A device is disclosed for measuring a tunnel section and, in particular, to obtain a graphical representation of the section. The device comprises a distance-measuring apparatus of the kind comprising a transmitter of directed radiation and a direction-sensitive receiver of the radiation, the transmitter and the receiver being arranged at a predetermined spacing from each other to define a measuring base. The transmitter and the receiver are arranged on a common support which is rotatable about an axis, the transmitter and the receiver being located substantially in a common plane which extends at right angles to the axis. The device further comprises drive means for varying in this plane the angular position of a radiation axis of at least one of either the transmitter or the receiver, control means for controlling the drive means and dependent upon the direction of radiation arriving to the receiver from the transmitter after having been reflected by a surrounding medium, and indication means for representing a magnitude as dependent upon an angle between the radiation axes of the transmitter and the receiver and of the measuring base. This magnitude is representative of the distance between the rotational axes of the support and a surface reflecting the radiation beam transmitted by the transmitter to the receiver.

3,620,626

PROXIMITY WARNING SYSTEM FOR AIRCRAFT

Richard T. Daly, Huntington, and Edmundas Vambutas, Douglaston, both of N.Y., assignors to Quantronix Corporation, Farmingdale, N.Y.

Filed May 29, 1969, Ser. No. 828,945
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **8 Claims**



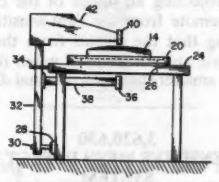
A simple, lightweight, inexpensive laser proximity warning system for aircraft operating under visual flight rules (VFR) conditions. Mounted on each fully equipped aircraft is a laser transmitter, a detector sensitive to laser radiation and a retroreflector. The laser transmitter and detector periodically scan a predetermined region of the space surrounding the aircraft. If another aircraft equipped with a retroreflector is within the predetermined region, the transmitted laser radiation will be returned to the detector which will activate an indicator in the cockpit to warn the pilot of the presence and approximate bearing of the other aircraft.

3,620,627

OPTICAL DENSITOMETER FOR MEASURING HOLE SIZES IN TELEVISION MASKS

John G. Davies, St. Paul, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed Jan. 15, 1970, Ser. No. 3,117
Int. Cl. G01n *21/00, 21/16, 2/32*
U.S. Cl. 356—72 **10 Claims**

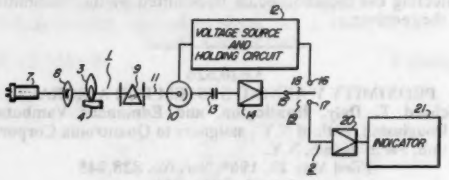


Apparatus for optically measuring the hole size over the curved surface of a shadow mask wherein a light source and a detector are both mounted on a pivot arm which allows the source to pass light perpendicularly through all portions of the curved surface of the mask to the detector.

3,620,628
PHOTOELECTRIC SAMPLE MEASURING APPARATUS

Kazuo Yasuda; Koichi Uchino; Koji Nishiwaki, and Hiroshi Inomata, all of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 30, 1969, Ser. No. 820,434
Claims priority, application Japan, May 4, 1968, 43/29545
Int. Cl. G01j 3/30
U.S. Cl. 356—87 5 Claims

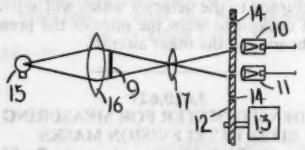


A system for analyzing the photometric properties of a sample of material, which comprises a means for projecting a light beam from a light source to a flame into which the sample to be analyzed and a reference material are alternately introduced, a detector for detecting the intensities of the sample beam and the reference beam which have been transmitted through the flame, and a means for comparing an electric signal indicative of the intensity of said sample beam obtained from said detector with the other electric signal indicative of the intensity of said reference beam.

3,620,629
OPTICAL GAUGES

Keith R. Whittington, Shelford, Cambridge, England, assignor to T. I. (Group Services) Limited, Birmingham, England

Filed May 26, 1969, Ser. No. 828,454
Claims priority, application Great Britain, June 12, 1968, 27,885/68
Int. Cl. G01b 11/04
U.S. Cl. 356—160 2 Claims



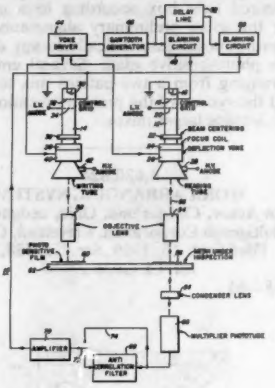
An optical gauge for determining the width of an object and including a rotary disc having apertures equiangularly spaced about the rotary axis of the disc and spaced a nominal distance apart, a pair of light-sensitive devices disposed on one side of the disc and spaced said nominal distance apart, and means for projecting an image of the object upon the side of the disc remote from the light-sensitive devices, the arrangement being that the signals from the light-sensitive devices can provide an indication of when the image of the object is larger or smaller than said nominal distance.

3,620,630
RADIATION-SENSITIVE MESH DEFECT INSPECTION SYSTEM

Rudolf C. Hergenrother, West Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 28, 1969, Ser. No. 828,612
Int. Cl. G01n 21/32
U.S. Cl. 356—237 16 Claims

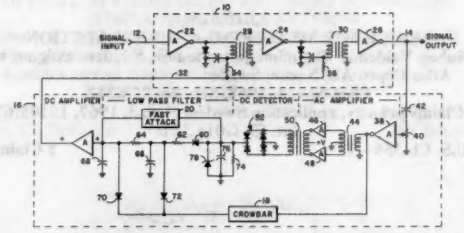
A mesh defect image inspection system incorporating a flying spot scanner tube together with an anticorrelator circuit utilizing two fixed delay lines of different lengths and matching the difference in delay time to a multiple of the time required to move the flying spot between two adjacent holes in the mesh member. The inputs of the delay lines in the anticorrelation circuit are in parallel and outputs in series opposition. A display means is provided, for example a video monitor tube. If a defect results in a mismatch of signals, a bright spot will be displayed and the detect may then be pinpointed.



3,620,631
GAIN-CONTROLLED AMPLIFIER

Benjamin F. Stopka, Fairport, N.Y.; Dennis J. Day, Cedar Rapids; James V. Harmon, Cedar Rapids, and Robert G. Holt, Cedar Rapids, Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Aug. 26, 1969, Ser. No. 853,022
Int. Cl. H04b 1/16
U.S. Cl. 325—404 6 Claims



Disclosed is a gain-controlled amplifier having a gain control loop including amplifying and filtering means for providing a control signal to the gain-controlled amplifier. The gain control loop further includes crowbar means for providing a maximum gain signal in response to a drop in input signal to the gain-controlled amplifier and fast attack means for providing minimum gain signal in response to a sudden increase in input signal to the gain-controlled amplifier.

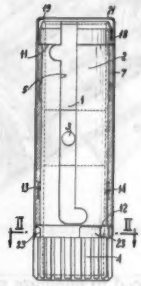
3,620,632
LIPSTICK AND SIMILAR HOLDER

Ralph Gruska, Saint-Maur, France, assignor to Ejectoret S. A., Geneva, Switzerland

Filed Oct. 1, 1969, Ser. No. 862,827
Claims priority, application France, Oct. 10, 1968, 169,355
Int. Cl. A45d 40/06
U.S. Cl. 401—78 3 Claims

A lipstick or like holder is largely of the conventional kind having two relatively rotatable coaxial sleeves. The inner sleeve has an external operating knob and the outer sleeve is fitted by force into a metallic reinforcing and/or decorative

tube. A godet for supporting the stick is slidable axially in the inner sleeve and has a lug extending through a slot in the inner sleeve and engaging a slot in the outer sleeve, one slot being longitudinal and the other helicoidal. In order to prevent unwanted relative rotation of the sleeves and the



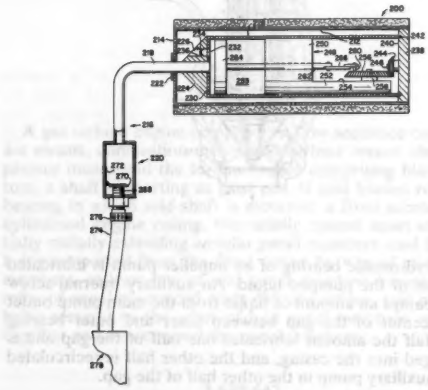
consequent risk of the stick engaging the cover the invention provides an extension on the metallic tube beyond that end of the outer sleeve adjacent to the operating knob. There are then two opposed faces, one on the extension and the other on the inner tube. A boss or bosses on one of these faces exerts or exert a braking force on the other face.

3,620,633

SELF-FEEDING PAINT ROLLER

Fred A. Charvoz, 446 East 5th St., Brooklyn, N.Y.

Filed Nov. 7, 1969, Ser. No. 874,762
Int. Cl. B43m *11/02*
U.S. Cl. 401—147 **6 Claims**



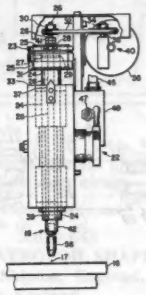
Self-feeding paint rollers in which the paint is automatically supplied to the roller as the roller is being rolled over a surface to be painted, has a drive gear connected to the roller and rotatable therewith. A cylinder and piston arrangement is mounted within the roller and is operably connected to the drive gear whereby rotation of the roller causes the piston to move in a first direction to supply paint from a paint can to the cylinder and to move the piston in a second direction to eject the paint from the cylinder into the roller for application to a surface to be painted.

3,620,634

SKIVING MACHINE

Herbert L. Sullivan, Orlando, Fla., assignor to Martin Marietta Corporation, New York, N.Y.

Filed June 25, 1969, Ser. No. 836,348
Int. Cl. B23b *41/00, 49/00*
U.S. Cl. 408—82 **10 Claims**



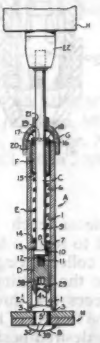
A machine for successively forming a plurality of access holes in a flexible electrical harness or similar type electrical device. The access holes are formed through an outer insulative covering which is laminated to one side of a copper or like conductive material circuit pattern. The access holes are formed by a rotating multipronged cutting blade mounted on the lower extremity of a simultaneously rotatable and vertically movable spindle which has a micrometer dial attached to its upper end in such a manner as to enable the adjustment of the depth of penetration of the blade into the insulation coating. The cutting head assembly of the machine comprises a spring biased pressure foot mounted in floating relation to the blade and used to engage and maintain the harness in proper position while the access hole is being formed.

3,620,635

RIVET REMOVING TOOL

Bert L. DalBianco, 19632 Adair Drive, Castro Valley, Calif.

Filed Sept. 25, 1969, Ser. No. 866,421
Int. Cl. B23b *51/04*
U.S. Cl. 408—84 **6 Claims**

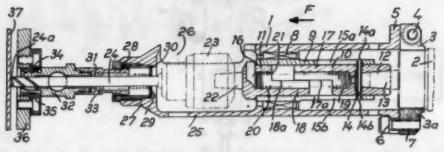


A rivet-removing tool in which a hollow cylindrical casing has one end provided with teeth that can contact the head of a rivet when the axis of the casing is aligned with the rivet axis. A chuck is rotated within the casing and has an inner set of teeth that will cut a circular groove in the rivet head when the chuck is moved against the head. The chuck also has an outer set of teeth that are brought into contact with the rivet head for cutting it until the head is severed from the rivet shank whereupon the rivet may be removed.

3,620,636
DRILLING DEVICE HAVING YIELDABLE MEANS FOR LIMITING THE THRUST PRESSURE TO A PREDETERMINED AMOUNT

Pierre Louis Simon Godard, Verneuil, France, assignor to Chrysler France, Paris, France

Filed Jan. 29, 1970, Ser. No. 6,763
Claims priority, application France, Jan. 30, 1969, 6901973
Int. Cl. B23b 47/02
U.S. Cl. 408—141 7 Claims



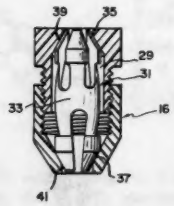
The invention has for its object a device for drilling sheet metal.

According to the invention, the pressure with which the drill is applied on the sheet is determined by a resilient member which is located between two drive members solid in rotation but not in translation and which are mounted in a sleeve which, during operation, rotates and slides in a fixed body of the device.

3,620,637
DRILL BIT STOP

George M. Brown, Parma, Ohio, assignor to Century Drill and Tool Company, Chicago, Ill.

Filed July 15, 1969, Ser. No. 841,774
Int. Cl. B23b 47/00, 49/00
U.S. Cl. 408—202 7 Claims



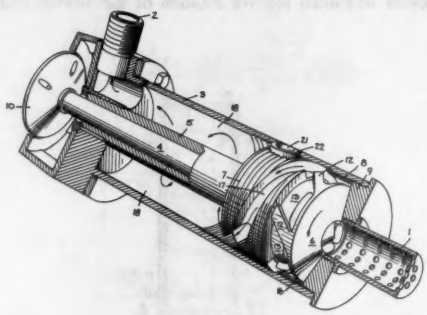
First and second pieces each having a tapered bore therethrough are joined to form a housing by threading one piece into the other. A collet having resilient fingers at each end is positioned within the housing. The housing is placed on the bit and the pieces are threaded together with the tapered bores closing the fingers of the collet about the bit to lock the housing in the desired position thereon to limit the passage of the bit through the workpiece.

3,620,638
LIQUID PROPULSION DEVICE

J. Arthur Kaye, Fort Lee, and Morgan E. Lentz, Rutherford, both of N.J., assignors to J. Arthur Kaye, Fort Lee, N.J.

Filed Aug. 24, 1970, Ser. No. 66,166
Int. Cl. F01d 3/00
U.S. Cl. 415—106 16 Claims

A propulsion mechanism, such as a pump, for propelling liquids first radially and then axially through the mechanism at high pressure, the mechanism having within a cylindrical

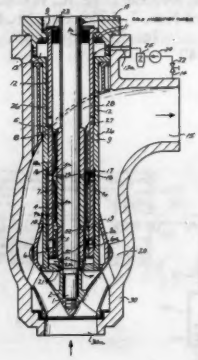


housing a rotor balanced to minimize radial and axial forces on the rotor whereby bearings are not required for the rotor.

3,620,639
PUMP WITH HYDROSTATIC BEARING

Karl Gaffal, Bobenheim-Roxheim, and Hans-Dieter Sturm, Frankenthal, both of Germany

Filed Aug. 21, 1970, Ser. No. 65,890
Claims priority, application Germany, Aug. 22, 1969, P 19 42 762.4
Int. Cl. F01d 11/00
U.S. Cl. 415—111 10 Claims



The hydrostatic bearing of an impeller pump is lubricated by a part of the pumped liquid. An auxiliary internal screw pump, pumps an amount of liquid from the main pump outlet to the center of the gap between inner and outer bearing parts. Half the amount lubricates one half of the gap and is discharged into the casing, and the other half is recirculated by the auxiliary pump in the other half of the gap.

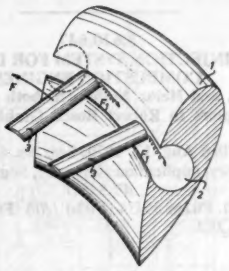
3,620,640
PROPELLER OR FAN SHROUDS

Jean Soulez-Lariviere, La Celle-Saint-Cloud, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 26, 1970, Ser. No. 22,748
Claims priority, application France, Mar. 27, 1969, Mar. 10, 1970; 6909125, 7007625
Int. Cl. F01d 25/24
U.S. Cl. 415—126 8 Claims

An improved propeller shroud comprising a toroidal cavity formed on its inside surface along its entire periphery level with the blades of said propeller and along the meridian of the shroud and movable flaps mounted on downstream of

same cooperating with a cavity bottom comprising a retractable wall with or without streamlined partition walls adapted

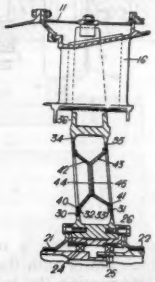


within said toroidal cavity and along substantially meridian planes of said shroud.

3,620,641
BEARING ASSEMBLY

John Michael Storer Keen; Maurice John Byett, and Francis Anthony Weston, all of Derby, England, assignors to Rolls-Royce Limited, Derby, England

Continuation-in-part of application Ser. No. 668,387, Sept. 18, 1967, now abandoned. This application Oct. 13, 1969, Ser. No. 865,942
Claims priority, application Great Britain, Oct. 6, 1966, 44764/66
Int. Cl. F01d *11/08, 1/02*
U.S. Cl. 415—170 **23 Claims**



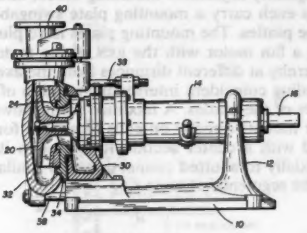
A gas turbine engine comprises in flow sequence compressor means, combustion means and turbine means, the compressor means and the turbine means comprising bladed rotors, a shaft supporting at least one of said bladed rotors, a bearing in which said shaft is mounted, a fixed substantially cylindrical engine casing, two axially spaced apart substantially radially extending annular panel members, said bearing being supported from the fixed casing by way of said panel members, at least one of said panel members having a plurality of angularly spaced-apart dished portions, said portions being secured to the other of said panel members to brace together and interconnect the panel members.

3,620,642
CENTRIFUGAL PUMP

James B. Studebaker, Littleton; George A. Minick, Golden, and John D. Whittier, Lakewood, all of Colo., assignors to A. R. Wilfley and Sons, Inc., Denver, Colo.

Filed Dec. 9, 1969, Ser. No. 883,397
Int. Cl. F04d *29/00, 29/44*
U.S. Cl. 415—204 **8 Claims**

A centrifugal pump includes an intake chamber means and a casing means having a follower plate means disposed therebetween. A runner or impeller means is mounted in the casing means and has the usual impeller vanes thereon. The follower plate means includes an annular lip extending toward the runner means and being disposed adjacent a labyrinth means on the runner means. In addition, the follower plate means includes an annular cap disposed radially outwardly of the runner means, this annular cap having a pair

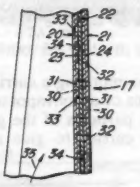


of sloping surfaces having different angular relationships to the axis of rotation of the runner means.

3,620,643
COOLING OF AEROFOIL SHAPED BLADES

John Windsor Jones, Skipton, England, assignor to Rolls-Royce Limited, Derby, England

Filed June 20, 1969, Ser. No. 835,083
Claims priority, application Great Britain, June 24, 1968, 30,103/68
Int. Cl. F01d *5/18*
U.S. Cl. 416—90 **4 Claims**

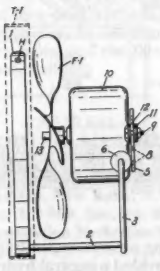


A hollow aerofoil-shaped blade for a fluid flow machine wherein the boundary wall of the blade is made up of a plurality of sheets bonded together. The sheets define therebetween cooling fluid ducting, each sheet having defined on the concave and/or convex faces of the blade, apertures which extend through the sheet and communicate with the ducting. The apertures on adjacent sheets are out of alignment such that cooling fluid supplied to the interior of the blade may pass to the exterior thereof by way of the ducting.

3,620,644
UNIVERSAL FAN MOUNT AND FAN

Gordon McLarty, Box 55, Augusta, Mich.

Filed July 6, 1970, Ser. No. 52,452
Int. Cl. F04d *29/64*
U.S. Cl. 416—247 **14 Claims**



A segmental arcuate ring springable to varying diameters has two parallel rods secured near its center and extending axially of the arc of the ring. An arcuate yoke is secured to

the opposite ends of the rods and extends generally parallel to ring to two spaced motor mounts. One form of the mounts is two inwardly turned and aligned pintles. Each pintle carries an angularly adjustable mounting block, and the mounting blocks each carry a mounting plate swingable about the axes of the pintles. The mounting plates have plural holes for mounting a fan motor with the axis of the motor and a fan driven thereby at different distances from the axes of the pintles, including coincident intersecting relation of the fan axis to the axes of the pintles. A modified form shows nonpivotable motor mounts directly on ends of a yoke formed from a single rod with a center section folded upon itself and extending axially to abutted connection to a similarly bent rod forming the segmental arcuate ring.

3,620,645

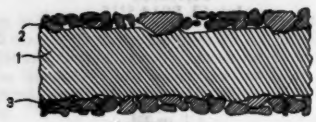
GETTER DEVICE

Paolo della Porta, Milan; Tiziano A. Giorgi, Milan; Bruno Kindl, Milan, and Mario Zucchinelli, Bergamo, all of Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Continuation of application Ser. No. 527,906, Feb. 16, 1966, now abandoned. This application May 1, 1970, Ser. No. 33,850

Int. Cl. F04b *37/02;* **B23p** *3/00;* **H01j** *7/18*

U.S. Cl. 417—48 **10 Claims**



A getter device comprising a carrier having on at least one of its faces particles of a nonvaporative getter metal characterized in that the particles of the getter metal are partially embedded in the carrier to give a highly efficient getter device.

3,620,646

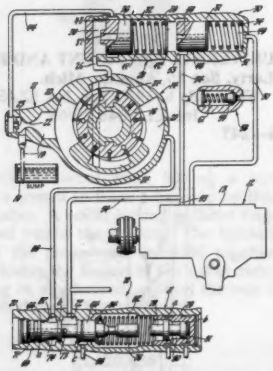
CENTRAL HYDRAULIC SYSTEM FOR A VEHICLE

Paul D. Stevenson, Ann Arbor, and Leon A. Tucholski, Belleville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 1, 1970, Ser. No. 51,572

Int. Cl. G05d *11/00;* **F04b** *23/04, 49/00*

U.S. Cl. 417—79 **3 Claims**



In a vehicle having an automatic transmission and power steering, there is provided a central hydraulic system wherein flow from a pump is directed to a first flow-control valve which delivers flow up to a predetermined rate to a second flow-control valve while delivering any excess fluid flow to an aspirator which acts to supercharge the pump. The second flow-control valve delivers flow up to a predetermined lower rate to the power steering system while delivering any excess fluid flow to the transmission control system which is also receiving all of the flow from the power steering system.

3,620,647

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

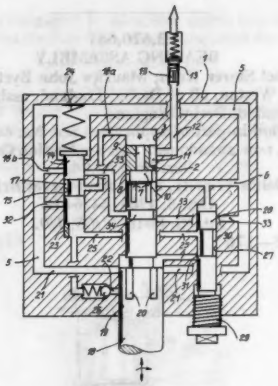
Gerald Hofer, and Heinz Nothdurft, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 12, 1970, Ser. No. 63,071

Claims priority, application Germany, Sept. 19, 1969, P 19 47 529.7

Int. Cl. F02m *59/34;* **F02d** *1/06;* **F04b** *19/22*

U.S. Cl. 417—293 **4 Claims**



A fuel injection system having a reciprocating control member driven in synchronism with the injection pump for opening a fuel and interrupting the injection process. The control member, during its return stroke, drives the fluid through a controllable throttle channel to create a fluid abutment," i.e., it does not return to the initial position. A second bypass is provided subject to control by the control member as well as by a slide valve; also synchronous with the main pump, the characteristic feature being the coordination of the control member with the slide valve in dependence on the variable position of the fluid abutment.

3,620,648

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Gerald Hofer, and Heinz Nothdurft, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 12, 1970, Ser. No. 63,215

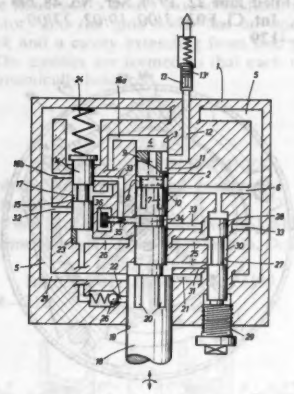
Claims priority, application Germany, Sept. 19, 1969, P 19 47 528.6

Int. Cl. F02m *59/34;* **F02d** *1/06;* **F04b** *19/22*

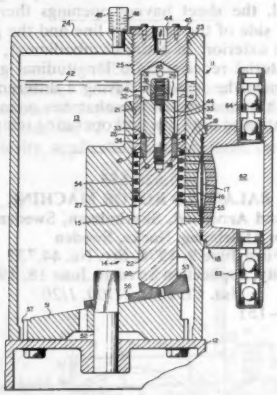
U.S. Cl. 417—293 **5 Claims**

A fuel injection system having a reciprocating control member driven in synchronism with the injection pump for opening a fuel bypass and interrupting the injection process. The control member, during its return stroke, drives the fluid through a controllable throttle channel to create a "fluid abutment," i.e., it does not return to the initial position. A second bypass is provided subject to control by the control member as well as by a slide valve; also synchronous with the

main pump, the characteristic feature being the coordination of the control member with the slide valve in dependence on the variable position of the fluid abutment and a throttling restriction provided in the second bypass.



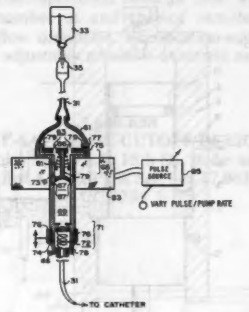
3,620,649
METERING PUMP
Francis H. Cary, North Scituate, R.I., assignor to General Signal Corporation
Filed Sept. 18, 1970, Ser. No. 73,360
Int. Cl. F04b *9/08, 35/02, 43/06, 45/00*
U.S. Cl. 417—383 **6 Claims**



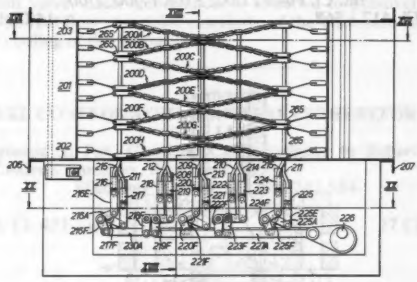
The disclosure concerns a metering pump of the type in which a primary hydraulic pump pulses a diaphragm which serves as a pumping unit for a secondary circuit. The primary unit is so constructed that its maximum rate of delivery can be changed in the field by substitution of a few parts and without using special tools or emptying the reservoir for the primary circuit.

3,620,650
GAS-DISABLED LIQUID-PUMPING APPARATUS
Robert F. Shaw, 350 Parnassus Heights, San Francisco, Calif.
Filed Dec. 5, 1969, Ser. No. 882,489
Int. Cl. F04b *35/04, 49/08, 7/04*
U.S. Cl. 417—417 **13 Claims**

Improved liquid-pumping apparatus uses a pumping chamber having a residual volume many times larger than the displacement volume and includes an outlet valve which is disposed within the lowermost region of the residual volume and which is biased against outflow of fluid therethrough for fluid pressures below a selected value.



3,620,651
FLUID FLOW APPARATUS
Peter Frederick Hufton, Derby, England, assignor to International Combustion (Holdings) Limited, London, England
Filed Feb. 3, 1970, Ser. No. 8,340
Claims priority, application Great Britain, Feb. 7, 1969, 6737/69
Int. Cl. F04b *19/00;* **B63h** *1/30;* **F03d** *5/06*
U.S. Cl. 417—436 **17 Claims**

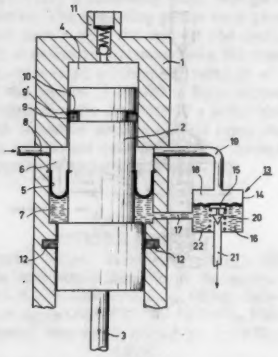


Fluid flow apparatus operable either as a pump or as a motor in which a flexible sheet is constrained by means of connections at spaced points along its length to follow a traveling wave motion. The flexible sheet forms one bounding surface for a fluid flow path which is also bounded by an opposed sideplate which may be another flexible sheet. The traveling wave motion maintains the flexible sheet in traveling contact with the sidewall.

3,620,652
COMPRESSOR WITH ROLLING DIAPHRAGM SEAL
Hendrik Alphons Jaspers, and Jacobus Hubertus Abrahams, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 3, 1969, Ser. No. 881,691
Claims priority, application Netherlands, Dec. 13, 1968, Oct. 22, 1969; 6,817,894, 6,915,905
Int. Cl. F04b *21/00;* **F16j** *15/50;* **F01b** *19/00*
U.S. Cl. 417—439 **10 Claims**

A hermetically sealed compressor having a rolling diaphragm seal between the piston and the cylinder with liquid support for the diaphragm. An inlet valve is formed by

a piston ring incorporated in a groove in the portion of the piston wall or located between the rolling diaphragm and the



working space. A control device maintains a substantially constant pressure differential across the diaphragm.

3,620,653

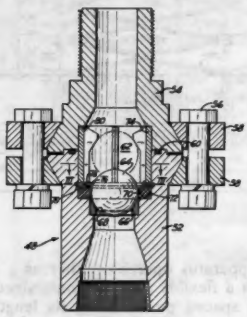
APPARATUS FOR CONTROLLING SOLIDS-LADEN LIQUIDS

Eber W. Gaylord, Pittsburgh, and Ernest A. Mori, Hampton Township, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 723,996, Apr. 25, 1968, now Patent No. 3,561,822. This application Dec. 23, 1969, Ser. No. 887,612

Int. Cl. F04b *21/02*; **F16k** *17/00, 1/00*

U.S. Cl. 417—568 **14 Claims**



A reciprocating pump for handling abrasive-laden liquids has ball-type inlet and outlet valves. An inlet valve is disclosed mounted directly on the pump cylinder in a position such that the valve plug moves substantially into the opening in the cylinder wall when the valve is in an open position to minimize the length of the passage from the valve seat into the pump. The valve has a spherical valve plug that moves in response to the pressure differential of the liquid handled to and from a closed position on a valve seat. An elastomeric seal ring precompressed to a pressure of at least 1,000 p.s.i. is positioned at the outlet end of the valve seat to engage the valve plug. In one embodiment of the invention, a lip extends around the outlet edge of the seal and in another the elastomeric seal is a composite of a ring of hard elastomeric material and a ring of a relatively soft elastomeric material.

3,620,654

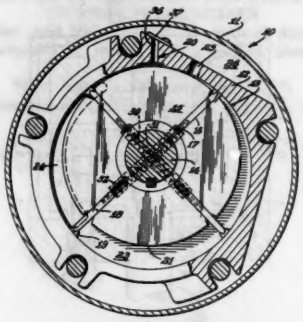
TANGENCY SEALS FOR COMPRESSORS

Clifford H. Allen, Chesterland, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed June 22, 1970, Ser. No. 48,290

Int. Cl. F03c *3/00, 19/02, 27/00*

U.S. Cl. 418—129 **14 Claims**



A compressor incorporating a rotor equipped with radially movable vanes eccentrically received in a cylindrical compressor chamber with the outer diameter of the rotor contacting the inner diameter of the compressor chamber along a line of tangency, the compressor chamber being equipped with a tangency seal to assure continued contact between the rotor and the compressor chamber carried seal. In one embodiment, the seal is a cantilever suspended strip backed by a pressure groove open to the interior of the compressor chamber on the high-pressure side of the tangency line, and the groove is ported to the exterior of the pressure chamber. In another embodiment, the seal member is a normally flat deformable sheet received in a variable depth groove in the chamber wall, the sheet having openings therethrough on high-pressure side of the tangency line and the groove being ported to the exterior. In a third embodiment, the seal is a length of material received in a longitudinal groove at the line of tangency, the material having a different rate of expansion than the material of the chamber member to maintain rotor contact at both low and operating temperatures.

3,620,655

BALANCED ROTOR MACHINE

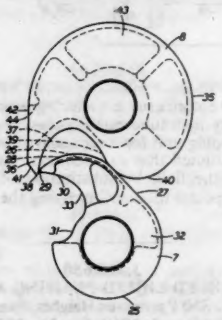
Bo Olof Roland Arnegard, Skarholmen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed June 9, 1970, Ser. No. 44,737

Claims priority, application Sweden, June 18, 1969, 8635/69

Int. Cl. F01c *21/00, 1/20*

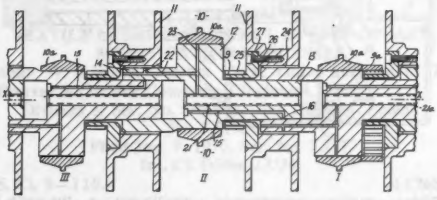
U.S. Cl. 418—151 **6 Claims**



Rotary piston machines have a casing with two intersecting cylindrical bores in which a main rotor and a gate rotor are

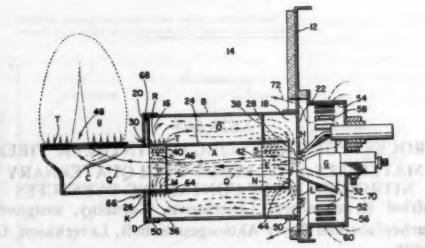
mounted for rotation. Each rotor has a hub and one tooth extending from the hub. The main rotor tooth has a concave flank and a convex flank and the gate rotor tooth has a concave and a second flank. The main rotor has an opening in the concave flank and a cavity extending from said opening into the rotor, and the gate rotor has an opening in the second flank and a cavity extending from said opening into the rotor. The cavities are formed so that each rotor is statically and dynamically balanced.

3,620,656
ROTARY PISTON ENGINES
John Sharples, Cheshire, England, assignor to Rolls-Royce Limited, Derby, England
Filed Sept. 29, 1969, Ser. No. 861,812
Claims priority, application Great Britain, Oct. 2, 1968, 46,739/68
Int. Cl. F01c *11/00*; F04c *11/00*
U.S. Cl. 418—210 **7 Claims**



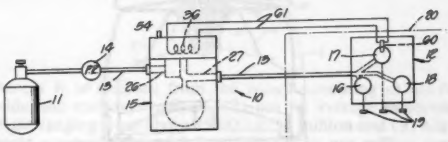
A multiunit arrangement of rotary piston engines has a three-section eccentric shaft. Each section of the shaft is driven by a rotary piston engine and one end of each section is an interference fit within the adjacent end of the neighboring section.

3,620,657
BURNERS
Edgar C. Robinson, North Vancouver, British Columbia, Canada, assignor to International Industries Ltd.
Filed May 13, 1970, Ser. No. 36,987
Claims priority, application Great Britain, Oct. 8, 1969, 49,496/69
Int. Cl. F23l *7/00*
U.S. Cl. 431—9 **24 Claims**



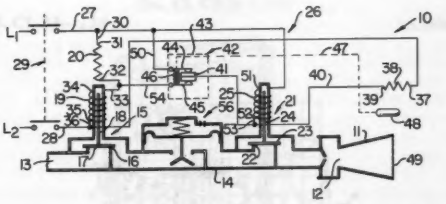
An oil burner consists of an outer jacket surrounded and spaced from an inner burner tube to provide a surrounding counterflow chamber. Jacket and tube project horizontally inwards from the surrounding combustion chamber wall. Counterflow chamber is substantially closed at both ends. Tube projects inwardly beyond counterflow chamber and terminates in an upfacing burner head. Communication exists at opposite ends of the part of tube surrounded by counterflow chamber. At startup a tongue of flame travels through tube from an injector nozzle. Part of flame counterflows back through surrounding chamber and recirculates through tube. Another part of flame proceeds on to burner head. When parts sufficiently heated, flame in tube is caused to be extinguished and is replaced by hot clear blue flame jets from burner and a multiapertured band in tube within limits of counterflow chamber at end thereof remote from nozzle where counterflow originates. Combustion-supporting air to both chambers adjustably admitted at nozzle end.

3,620,658
FAIL-SAFE FUEL CUTOFF DEVICE
Charles L. Tappin, 14504 S.E. 15th St., Bellevue, Wash.
Filed Apr. 9, 1970, Ser. No. 27,083
Int. Cl. F23d *5/12*
U.S. Cl. 431—13 **19 Claims**



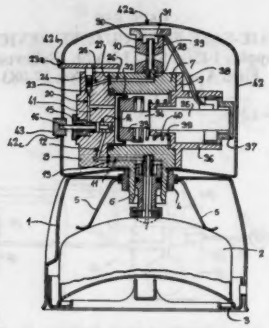
A fail-safe safety fuel cutoff system for heating equipment fueled with pressurized gas, such as LPG, hazardous to life if accidentally escaping into an enclosure. The system utilizes a main cutoff valve of the pilot-controlled type and equipped with an operating solenoid normally energized by a thermocouple having its hot junction exposed to the burner. In one preferred embodiment, a reserve quantity of fuel is automatically stored adequate to operate the burner to energize the thermocouple and open the cutoff valve whereas, in a second embodiment, a secondary power source is utilized initially to hold the main valve open until the thermocouple reaches its operating temperature and assumes control of the cutoff valve. Each embodiment is effective to positively cut off all fuel flow at a point exteriorly of the enclosure following cooling of the thermocouple.

3,620,659
FUEL CONTROL SYSTEM AND PARTS THEREFOR OR THE LIKE
Raymond J. Fox, Glendale, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed July 9, 1968, Ser. No. 743,554
Int. Cl. F23n *5/00*
U.S. Cl. 431—66 **27 Claims**



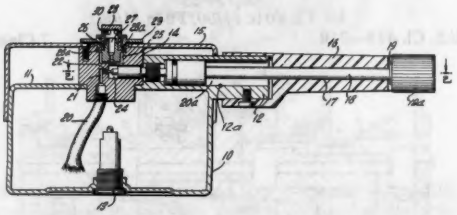
This disclosure relates to a fuel control system for a fuel-burning apparatus wherein an electrical switch is adapted to sense the nonignition condition and ignition condition of an electrically operated ignition means for the burner means in such a manner that when the system is initially energized, the switch means opens a first valve means while energizing the ignition means and when the ignition means reaches an ignition condition, the switch means places the first valve means in a holding circuit to maintain the same in an open position and operates another valve means downstream from the first valve means to permit fuel to issue from the main burner means and be ignited by the ignition means.

3,620,660
LIGHTING DEVICES FOR GAS BURNERS
Jacques Laurent, Sainte-Foy-les-Lyon, France, assignor to Application Des Gaz, Paris, France
Filed Nov. 20, 1969, Ser. No. 878,402
Claims priority, application France, Nov. 29, 1968, 50694
Int. Cl. F23q *3/00*
U.S. Cl. 431—255 5 Claims



A lighting device associated to a burner operating with a gas under pressure is actuated by the pressure of the gas supplied to the burner in order that the latter may be lighted automatically. In an embodiment the gas under pressure is supplied to the burner through a main gas valve, a throttling device being inserted between the valve and the throttling device. The movable actuating member of a piezoelectric lighting device receives the action of a deformable diaphragm which closes an open-ended pneumatic chamber the latter being connected with the gas conduit at a point thereof situated between the gas valve and the throttling device. The gas burner is thus automatically lighted when the valve is turned on.

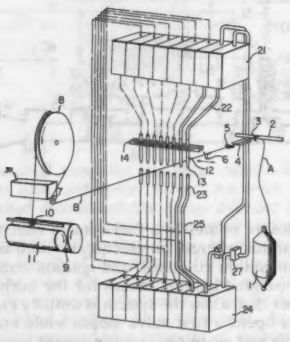
3,620,661
PORTABLE HEATING DEVICE
Herman Schlamp, Cologne, Rhine, Germany, assignor to Ronson Corporation, Woodbridge, N.J.
Continuation of application Ser. No. 684,136, Nov. 20, 1967, now abandoned. This application Feb. 11, 1970, Ser. No. 9,123
Int. Cl. A61k *15/04*
U.S. Cl. 431—344 2 Claims



This invention relates to a portable heating device having a self-contained fuel supply therein in which the amount of fuel supplied to a burner on the heating device can be varied by manipulating a control on the handle of the heating device.

CHEMICAL

3,620,662
METHOD AND APPARATUS FOR INTERMITTENTLY DYEING YARNS
Ryou Miyamoto, Amagasaki-shi; Kunio Hashizume, Ishikawa-gun, Ishikawa-ken, and Hiroshi Kitamura, Ishikawa-gun, Ishikawa-ken, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan and Maruichi Seni Kabushiki Kaisha, Ishikawa-ken, Japan, part interest to each
Continuation-in-part of application Ser. No. 549,857, May 13, 1966, now abandoned. This application Oct. 21, 1969, Ser. No. 871,416
Int. Cl. D06p *5/00*
U.S. Cl. 8—14 2 Claims



A method and apparatus for dyeing yarn for creating a very detailed, complicated pattern of variegation. Streams of dye liquors are discharged in a specified first direction from a nozzle assembly comprising one or more dye liquor nozzles. At the same time the entire nozzle assembly is traversed by a traversing means in a second direction transverse to said first direction. The yarn is run between a supply and a takeup means in the direction of its length in a third direction across the streams of dye liquors and is traversed by a yarn traversing means transversely to the third direction and the first direction.

3,620,663
PROCESS FOR THE DYEING OF SYNTHETIC FIBER MATERIALS AND BLENDS WITH QUATERNARY NITROGEN GROUP CONTAINING DYESTUFFS
Winfried Kruckenberg, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed June 1, 1967, Ser. No. 642,684
Claims priority, application Germany, June 10, 1966, F 49435
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 8 Claims

Process for dyeing synthetic fiber materials e.g. aromatic polyester, and fiber blends, e.g. blends of polyester with wool, in an aqueous solution at a pH of 4–6.5 at temperatures of about 98° to 140° C. with a quaternary nitrogen group containing dyestuff, said dyestuff being free of sulfonic and carboxylic acid groups.

3,620,664

PHENYL-N-ARYLCARBAMATES AND A PROCESS OF PRODUCING CELLULOSE N-ARYLCARBAMATES THEREFROM

Stanley R. Hobart, New Orleans, La.; Howard H. McGregor, Jr., Cambridge, Mass., and Charles H. Mack, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

Division of Ser. No. 668,974, Sept. 19, 1967, Pat. No. 3,584,000
Filed Feb. 27, 1970, Ser. No. 18,394
Int. Cl. D06m *13/42*
U.S. Cl. 8—120 13 Claims

Novel phenyl N-arylcarbamates and diphenyl N,N'-arylenedicarbamates are produced. Such compounds when applied to cellulosic materials and heated produce isocyanates in situ which in turn react with the cellulose to produce cellulosic materials having improved rot resistance and acid dye affinity.

3,620,665

TEXTILE LUBRICANT USEFUL IN AMINOPLAST MODIFICATION PROCESSES

Arthur W. Lanner, Terrace Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 559,890, May 18, 1966, Patent No. 3,519,562
Filed Jan. 9, 1970, Ser. No. 7,291
Int. Cl. D06m *13/34*
U.S. Cl. 8—115.6 4 Claims

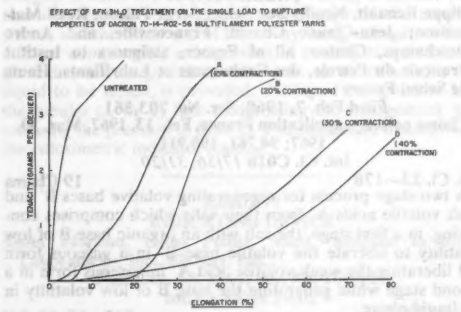
Lubricant compositions comprising certain oxidized Fischer-Tropsch waxes, and selected quaternary ammonium compounds alone or in combination with ethoxylated alcohols or phenols, are used as lubricants in the application of durable-press treating agents to cotton or cotton-synthetic fabrics.

3,620,666

PROCESS FOR CHEMICALLY TEXTURING POLYESTER FIBERS

Robert W. Lenz, Amherst; Leo Barish, Sharon, and Virginia L. Lyons, Arlington, all of Mass., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 1, 1968, Ser. No. 718,020
Int. Cl. D06m *13/08*
U.S. Cl. 8—130.1 15 Claims


EFFECT OF 6FK-3H2O TREATMENT ON THE SINGLE LOAD TO RUPTURE PROPERTIES OF DACRON 70-14-R02-56 MULTIFILAMENT POLYESTER YARNS
UNTREATED
A (10% CONTRACTION)
B (20% CONTRACTION)
C (30% CONTRACTION)
D (40% CONTRACTION)
TENACITY (GRAMS PER DENIER)
ELONGATION (%)

Process for chemically texturing fibers, particularly polyester fibers, by treatment of the fibers with treating agents in aqueous solution of perfluorinated or perfluorochlorinated ketone hydrates which cause differential swelling to occur between the skin and core of the fibers.

3,620,667

METHOD OF REMOVING TUBERCLES FROM A FERROUS SURFACE AND INHIBITING FURTHER TUBERCLE FORMATION THEREON

William E. Zimmie, 5192 Park Lane, North Olmsted, Ohio

Continuation-in-part of application Ser. No. 808,374, Mar. 13, 1969, now abandoned , which is a continuation of application Ser. No. 464,868, June 17, 1965, now abandoned. This application Nov. 18, 1969, Ser. No. 877,865
Int. Cl. C23f *11/12*, *11/14*; B08b *9/08*
U.S. Cl. 21—2.7 5 Claims

Treating a ferrous surface to remove tubercles of corrosion and inhibit further corrosion includes the steps of providing an aqueous solution of polyelectrolytic organic polymer and applying it to the corroded ferrous surface. The polymer (1) is prepared from compounds characterized by the formula:

wherein R is selected from the group consisting of nitrile, amide and carboxyl radicals, (2) has an average molecular weight ranging from about 25,000 to 25 million and (3) has a weight concentration of 0.1 to 1,000 parts per million parts of water.

3,620,668

AMMONIATED WET PROCESS PHOSPHORIC ACID SUSPENSION BASE

Paul R. Cutter, Golden, Colo., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 17, 1968, Ser. No. 729,909
Int. Cl. C01b *25/28*
U.S. Cl. 23—107 7 Claims

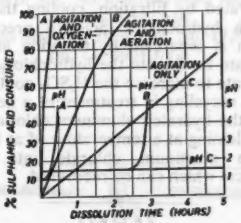
An ammoniated wet process phosphoric acid suspension base is prepared by mixing wet process orthophosphoric acid and superphosphoric acid to provide a mixture containing about 10–20 percent polyphosphoric acid, and ammoniating the mixture to provide an N/P_2O_5 ratio of about 0.32–0.35 and thereafter cooling the material and seeding with finely divided diammonium phosphate crystals. Attapulgite clay may be added just before the seeding step.

3,620,669

PRODUCTION OF NICKEL SULFAMATE

Nicolas Zubryckyj, Fort Saskatchewan, and David John Ivor Evans, Edmonton, both of Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Continuation of application Ser. No. 416,818, Dec. 8, 1964, now abandoned. This application June 2, 1969, Ser. No. 834,583
Int. Cl. C01b *17/98*
U.S. Cl. 23—114 1 Claim

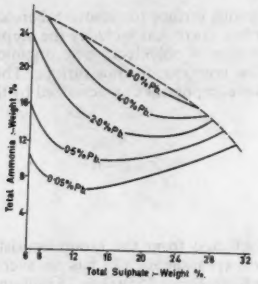


A process for preparing nickel sulfamate by dissolution of nickel powder in aqueous sulfamic acid solution. Very rapid nickel dissolution rate is obtained by oxygenating a suspension of nickel powder in sulfamic acid solution with substantially pure oxygen gas while controlling the pH of the system below about 5.0.

3,620,670
RECOVERY OF LEAD VALUES FROM SOLUTION

Geoffrey Charles Bratt, Tasmania, Australia, and Dereck Wilson Brown, Singapore, assignors to Electrolytic Zinc Company of Australia Limited, Melbourne, Victoria, Australia

Filed July 22, 1969, Ser. No. 843,295
Claims priority, application Australia, July 25, 1968, 41175/68
Int. Cl. C01g 21/20
U.S. Cl. 23—127 2 Claims



Simplified representation of equilibrium solubilities of lead sulphate in ammoniacal ammonium sulphate solutions at 25°c.

Recovery of lead values from lead-bearing material, by leaching the said material at ambient temperature for a period not exceeding 1 hour with a mixture of ammonium sulfate and aqueous ammonia to produce a supersaturated solution, separating undissolved substances, treating the resultant solution at a temperature higher than that at which the leaching operation was effected without substantial loss of ammonia, to cause precipitation of a major portion of the lead content from the said solution, and separating the precipitated solids.

3,620,671
PROCESS FOR THE ACID TREATMENT OF ALUMINOUS ORES FOR THE RECOVERY OF ALUMINA

Pierre Maurel, and Pierre Duhart, both of Aix En Provence, France, assignors to Compagnie Pechiney, Paris, France

Filed Oct. 17, 1968, Ser. No. 768,240
Claims priority, application France, Oct. 25, 1967, 125,817
Int. Cl. C01b 7/30
U.S. Cl. 23—143 12 Claims

The recovery of alumina from acid treatment of aluminous ores wherein iron, magnesium and potassium present in the ores are also recovered, including treating the ore with aqueous suplhuric acid solution to extract the solubles, washing the residue with water to extract the complex sulfates of iron, potassium and magnesium and recovering same by crystallization upon concentration, diluting the sulfate liquor with water to reduce the H_2SO_4 content to about 500 g. per liter and then cooling to a temperature below 50° C. while saturating with HCl to precipitate hydrated aluminum chloride which is seaprated by filtration, cooling the filtrate while saturating with hydrochloric acid to precipitate sodium chloride which is separated by filtration and heating the remaining filtrate to liberate the hydrochloric acid, concentrating the filtrate to increase the H_2SO_4 content to 750–850 g. per liter for recycling in treatment of a new batch of ore and purifying the hydrated aluminum chloride by recrystallization and calcining at a temperature of at least 550° C. to dissociate the aluminum chloride into alumina and hydrochloric acid which can be recovered.

3,620,672
METHOD OF PREPARING ANHYDROUS PHOSPHORUS ACID

Algirdas C. Poshkus, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 19, 1968, Ser. No. 753,747
Int. Cl. C01b 25/16; C07c 1/20
U.S. Cl. 23—165 4 Claims

Anhydrous phosphorous acid may be readily prepared by thermolizing dialkyl hydrogen phosphites at temperatures less than 220° C. in accordance with the equation:

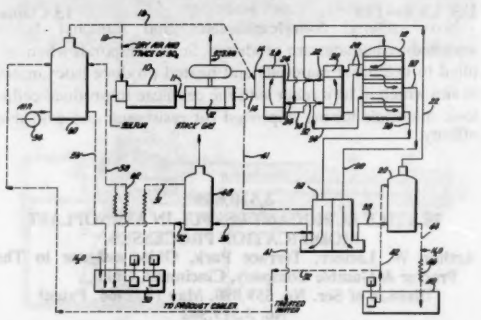
$$(RO)_2PHO \quad 2R_{-7E}\text{-}H+H_3PO_3$$

In the formulas set forth, R is an alkyl group of from two to eight carbon atoms.

3,620,673
METHOD OF PRODUCING SULFURIC ACID

Timothy J. Browder, Jr., Los Angeles, Calif., assignor to The Ralph M. Parsons Company, Los Angeles, Calif.

Filed Mar. 21, 1968, Ser. No. 715,084
Int. Cl. C01b 17/76
U.S. Cl. 23—168 7 Claims



Hot combustion gases bearing sulfur dioxide produced by burning sulfur in air are cooled in a waste heat boiler and a heat exchanger before introduction into a multipass catalytic converter. The majority of the sulfur dioxide is converted to sulfur trioxide in the converter in the presence of a catalyst. Intermediate and final absorption stages remove the sulfur trioxide. The stream leaving the waste heat boiler is cooled in the heat exchanger to the required initial conversion temperature by indirect heat transfer with a return gas stream from the intermediate absorption stage. In addition, the return gas stream from the intermediate absorption stage cools the primary catalysis reaction gas stream between conversion passes. After the last conversion pass of the primary catalysis and before intermediate absorption, the primary catalysis reaction stream is cooled in an economizer, boiler or the like. The return gas stream from the intermediate absorption stage after being heated in heat exchangers undergoes further catalytic conversion in the converter and then additional absorption takes place.

3,620,674
PROCESS FOR REGENERATING VOLATILE BASES AND VOLATILE ACIDS FROM THE SALTS FORMED THEREWITH

Philippe Renault, Neuilly Sur Seine; Serge Falcon, Rueil Malmaison; Jean-Claude Chavin, Franconville, and Andre Deschamps, Chatou, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Hauts de Seine, France

Filed Feb. 7, 1968, Ser. No. 703,581
Claims priority, application France, Feb. 13, 1967, Mar. 30, 1967; 94,761, 100,911
Int. Cl. C01b 17/56, 31/20
U.S. Cl. 23—178 19 Claims

A two-stage process for regenerating volative bases B′ and weak volatile acids A′ from their salts which comprises contacting, in a first stage, the salt with an organic base B of low volatility to liberate the volatile base B′ in a gaseous form and liberating the weak volatile acid A′ in gaseous form in a second stage while generating the base B of low volatility in the liquid phase.

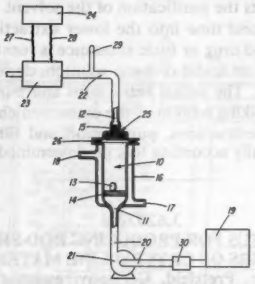
3,620,675
APPARATUS FOR THE MEASUREMENT OF DISSOLUTION RATES

Carter L. Olson, Columbus, Ohio, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 10, 1969, Ser. No. 797,965
Int. Cl. B01f 1/00; G01m 21/28, 27/46
U.S. Cl. 23—230 R 6 Claims

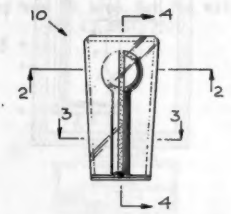
An apparatus for the measurement of dissolution rates of solid materials such as tablets, capsules, modules, or the like,

includes a dissolution fluid reservoir, pumping means for the fluid, a dissolution chamber adapted to receive a solid



material to be dissolved and the dissolution fluid, and means for measuring the concentration of the dissolved solid in the effluent from the dissolution chamber.

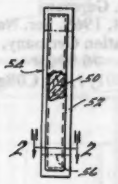
3,620,676
DISPOSABLE COLORIMETRIC INDICATOR AND SAMPLING DEVICE FOR LIQUIDS
Ward Benjamin Davis, Glendale, Calif., assignor to Sterilizer Control Royalties (a Trust), Los Angeles, Calif.
Filed Feb. 20, 1969, Ser. No. 800,887
Int. Cl. B65d *83/00;* **G01n** *31/22, 33/18*
U.S. Cl. 23—253 TP **6 Claims**



A disposable colorimetric indicator and sampling device for liquids is formed by embossing a synthetic plastic sheet with a syringelike cavity and closing the cavity by adhering a plane synthetic plastic sheet over the cavity, the two sheets being either heat sealed or adhesively joined together on the margins around the cavity, the cavity having a tubular portion one end of which opens at the edge of the adhered sheets, and the other end of the cavity being enlarged to form a finger compressible enlargement. A coating of a colorimetric indicator composition, soluble in or reactive with the liquid to be tested, is provided, the liquid being drawn into the tubular cavity by first compressing the enlargement, and releasing the pressure to draw in a liquid sample to react with the colorimetric indicator coating.

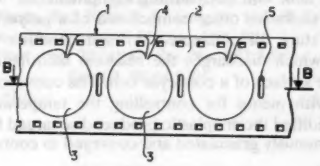
3,620,677
INDICATING DEVICE
Ayers Morison, Gross Pointe, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Dec. 18, 1961, Ser. No. 160,127
Int. Cl. G01n *29/02*
U.S. Cl. 23—253 **21 Claims**

1. An indicating device comprising in combination a porous capillary material characterized by connected voids of sufficiently small size to induce the progressive absorption of a fluid, and an impervious covering material enclosing at least the major portion of the exterior surfaces of said capillary material and disposed in intimate contact therewith defining an absorptive cavity of a preselected volume, said device constructed to provide directional guidance through said absorptive cavity of a fluid contacting an exposed surface of said capillary material, indicating means on said indicating device, said capillary material within said absorptive cavity operable in conjunction with a fluid absorbed to



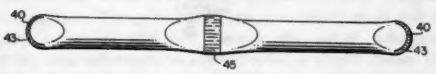
evidence in combination with said indicating means a characteristic of the fluid absorbed therein.

3,620,678
INSTALLATION FOR MULTIPLE AND AUTOMATIC ANALYSES
Jean Guigan, 9, rue Jean Mermoz, 75-Paris 8 eme, and Robert Laucournet, 15 ter rue des Tournelles, 94 L'Hay-les-Roses, both of France
Filed Sept. 8, 1967, Ser. No. 666,302
Claims priority, application France, Sept. 8, 1966, Oct. 5, 1966, Mar. 24, 1967, July 4, 1967; 75,754, 78,946, 100,324, 113,080
Int. Cl. G01n *33/16, 21/00*
U.S. Cl. 23—253 R **8 Claims**



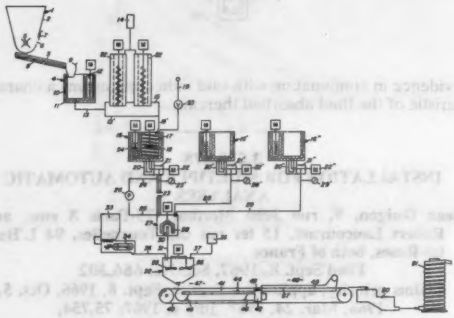
Device for multiple and automatic analysis including means for picking up a given substance to be analyzed at least one means for transferring a given quantity of liquid from one container to another, at least one means for mechanical treatments and at least one measuring means, said substance being conveyed from one of said means to another one in vessels carried by conveyors constituted by two pliant strips.

3,620,679
STERILE TEST TUBES
Donald H. De Vaughn, 106 Ridgewood Drive, San Rafael, Calif.
Division of Ser. No. 678,766, Sept. 25, 1967, Pat. No. 3,542,618
Filed Mar. 16, 1970, Ser. No. 19,990
Int. Cl. B01l *3/14*
U.S. Cl. 23—259 **3 Claims**



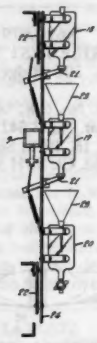
A test tube of plastic material having flattened-out, fused opposite ends and a chemically clean, completely sterile interior. In the preferred embodiment the end edges of the tube are rounded, both internally and externally. This minimizes retention of residual matter of the contents of the tube in the corners of the tube during practical use.

3,620,680
APPARATUS FOR CONTINUOUSLY MAKING THERMOPLASTIC POLYURETHANES
Gunter Friedrich Bartel; Martin Klawitter, and Ernst Denker, all c/o Die Kunststoffburo Osnabruck Dr. Reuter GmbH, 4531 Lotte, Hannover, Germany
Filed July 24, 1969, Ser. No. 844,268
Claims priority, application Germany, Mar. 10, 1969, P 17 70 990.9
Int. Cl. B01j *1/00*; **C08g** *22/04*
U.S. Cl. 23—260 **4 Claims**



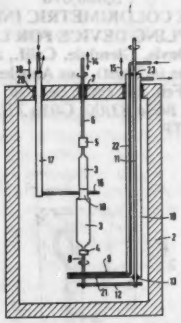
A process and an apparatus for making thermoplastic polyurethanes continuously, the apparatus combining a storage tank and dehydrating equipment for a polyol and storage tanks for other components of a polyurethane reaction mixture all connected through conduits to a mixing device which discharges the reaction mixture continuously over the surface of a conveyor belt. The conveyor belt is provided with means for controlling the temperature thereof. The solidified thermoplastic product discharged from the belt is continuously granulated and conveyed to containers.

3,620,681
APPARATUS FOR EXTRACTION OF DRUGS AND TOXIC SUBSTANCES FROM BLOOD, SERUM AND OTHER LIQUID
Eric S. Wright, 14947 Clymar St., Compton, Calif.
Filed Oct. 6, 1969, Ser. No. 863,892
Int. Cl. B01d *11/02*, *11/04*
U.S. Cl. 23—267 C **2 Claims**



Said apparatus is housed on and in a convenient metal frame. It has three extraction chambers arranged vertically. It extracts the desired drug or toxic substance from the sample with a suitable solvent. This extraction is carried out in the upper extraction chamber, after which the solvent is filtered into the midextraction chamber, and the sample or aqueous phase is retained. The middle extraction chamber contains carbon black, some other adsorbing agent or aqueous solution which effects the purification of the solvent. The solvent is filtered a second time into the lower extraction chamber where the desired drug or toxic substance is reextracted from the solvent into an acidic or basic solution, depending on its chemical nature. The actual extractions and purification are effected by a shaking motion of the extraction chambers, and all operations (extractions, purification and filtrations) are done automatically according to a predetermined program.

3,620,682
APPARATUS FOR PRODUCING ROD-SHAPED MEMBERS OF CRYSTALLINE MATERIAL
Wolfgang Keller, Pretzfeld, Germany, assignor to Siemens Aktiengesellschaft
Continuation of application Ser. No. 578,088, Sept. 8, 1966, now abandoned. This application Oct. 31, 1969, Ser. No. 871,783
Int. Cl. B01j *17/00*
U.S. Cl. 23—273 SP **5 Claims**

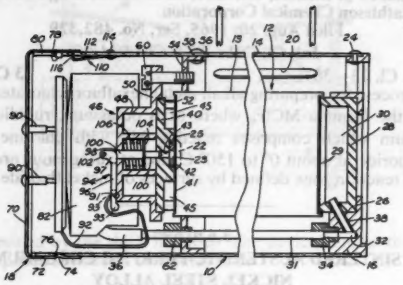


Combination in apparatus for producing rod-shaped members of crystalline material includes a sealed receptacle having a top wall, bottom wall and lateral wall portions, a pair of rod holders located in the receptacle substantially along the vertical central axis of the receptacle for supporting a rod-shaped member of crystalline material therebetween, heating means mounted in the receptacle for producing a melting zone in the rod-shaped crystalline member, the heating means and the holders being displaceable relative to one another for passing the melting zone along the rod-shaped crystalline member, and drive means extending into the receptacle through a wall portion other than the bottom wall portion from a location outside the receptacle for moving the holders and the heating means relative to one another.

3,620,683
GAS GENERATOR
Vladimir Hwoschinsky, Buffalo; James E. Nelson, Williamsville, and Paul W. Westcott, North Tonawanda, all of N.Y., assignors to A-T-O Inc., Cleveland, Ohio
Filed Nov. 14, 1968, Ser. No. 775,769
Int. Cl. B01j *7/00*
U.S. Cl. 23—281 **11 Claims**

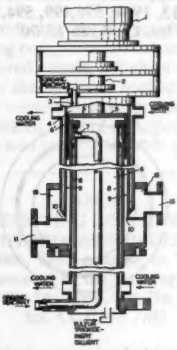
A housing for encasing a gas generator comprising a shell formed of a filament-wound epoxy comprising glass filaments bonded with epoxy and having vent passages therethrough. The shell is closed at the bottom end and is provided with a removable cover at the upper end. Breathing equipment is compactly stored within the upper end of the housing and is connected to the cover for removal therewith. A firing mechanism is operatively connected to the cover and is adapted to be actuated upon removal of the cover. A detent is mounted in the housing for indicating that the cover has

been axially shifted. Mounting members are pivotally mounted on the shell of the housing for attachment to a fixed



support structure. When detached, the mounting members serve as handles in manually carrying the assembly.

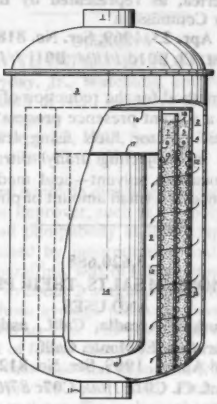
3,620,684
APPARATUS FOR CONTINUOUS SULFONATION
Richard J. Brooks, and Burton Brooks, both of Seattle, Wash., assignors to Chemithon Corporation, Seattle, Wash.
Division of Ser. No. 405,215, Oct. 20, 1964, abandoned, which is a Continuation-in-part of Ser. No. 320,301, Oct. 31, 1963, Pat. No. 3,350,428, which is a Continuation-in-part of Ser. No. 244,096, Dec. 12, 1962, Pat. No. 3,259,645
Filed Nov. 18, 1966, Ser. No. 611,784
Int. Cl. B01j *1/00*
U.S. Cl. 23—285 **6 Claims**



An apparatus for reaction of fluids comprising two externally cooled substantially concentric, circular reaction surfaces, forming a reaction space therebetween of one-eighth to one-half inch and a rotor located concentrically between the reaction surfaces.

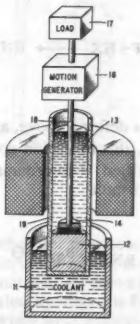
3,620,685
RADIAL FLOW CATALYST REACTOR
Ronald S. Rogers, and Oliver P. Proctor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed July 30, 1969, Ser. No. 846,005
Int. Cl. B01j *9/04*; **C07b** *3/00*
U.S. Cl. 23—288 R **4 Claims**

A radial flow catalyst reactor designed to provide maximum area of exposure of catalyst to a fluid feed while yet providing for rapid removal of effluent of the reaction from the reactor. For larger reactors, an internal space-occupying thumb reduces fluid-flow space and increases the rapidity of escape of the effluent. The reactor and catalyst cases are



designed to allow for overfill to permit settling of catalyst particles in the cases without bypassing of the catalyst.

3,620,686
METHOD FOR SOLIDIFYING WHILE RUBBING THE SOLID-LIQUID INTERFACE
William G. Pfann, Far Hills, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 20, 1969, Ser. No. 851,656
Int. Cl. B01d *9/00*
U.S. Cl. 23—295 **6 Claims**



The microstructure and the impurity distribution in a solid which has been directionally solidified from a melt or solution can be strongly influenced by rubbing the solid-liquid interface during solidification. If the solid has two or more phases, a major effect will be the production of a fine-grain microstructure. The grains in addition to being small will be roughly equiaxial and not possess the usual columnar, dendritic and substructures. If the solid is single phase, the rubbing should break up the diffusion layer in the liquid, which is, typically, enriched in one or more of the constituents, and the equilibrium segregation coefficient between the solid and the liquid should be realized in normal freezing. Fine-grained microstructures have recently become of interest in the field of superplasticity and an important application of normal freezing of a single-phase material is in the desalination of water.

3,620,687

ORGANIC PHASE REDUCTION OF PLUTONIUM IN A PUREX-TYPE PROCESS

Archie S. Wilson, Richland, Wash., assignor to the United States of America, as represented by the United States Atomic Energy Commission

Filed Apr. 23, 1969, Ser. No. 818,822
Int. Cl. B01d 11/04; B01j 1/10
U.S. Cl. 23—341 2 Claims

An improved method for the reduction of uranium (VI) to uranium (IV) in a solvent presence process for reprocessing irradiated nuclear reactor fuels using tributyl phosphate (Purex Process) by subjecting uranyl nitrate in a tributyl phosphite—hydrocarbon solvent—acid media to ultraviolet light in the presence of a small amount of phosphoric acid.

3,620,688

FLUOROAMMONIUM SALTS, THEIR PREPARATION, AND USES

Vytautas Grakauskas, Arcadia, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 1, 1969, Ser. No. 812,432
Int. Cl. C01c 1/00; C07c 87/06
U.S. Cl. 23—356 8 Claims

This patent describes novel N-fluoroammonium salts having the general formula

$$RNH_2F^{\oplus}X^{\ominus}$$

wherein R is selected from the group consisting of hydrogen, alkyl, substituted alkyl, cyclic or heterocyclic radicals; and X is selected from the group consisting of ClO_4^{-} and HSO_4^{-}. This patent further describes the preparation of the above-identified compounds in accordance with the following general reaction equation

$$R'-\overset{\overset{O}{\|}}{C}-\overset{\overset{R}{|}}{N}-F+HX \longrightarrow RNH_2F^{\oplus}X^{\ominus}$$

wherein R and X are as defined above, and R′ is alkyl, alkoxy or amino. Still further, this invention comprises the hydrolysis of the above-identified N-fluoroammonium salts or the following salts of the formula

$$RNH_2F^{\oplus}SO_3Y^{\ominus}$$

wherein R is a previously defined and Y is a lower alkyl, typically having up to six carbon atoms, e.g. methyl or ethyl, to form N-fluoroamines in situ, and the reaction of the N-fluoroamines with ketones in accordance with the following general equation

$$R''-\overset{\overset{O}{\|}}{C}-R'''+RNHF \xrightarrow[H_3O^+]{} \begin{matrix} R'' \\ \diagdown \\ C=O \\ | \\ N-R \\ \diagup \\ R''' \end{matrix} \text{ and/or } \begin{matrix} R''' \\ \diagdown \\ N-R \\ | \\ C=O \\ \diagup \\ R'' \end{matrix}$$

wherein R″ and R‴ is selected from the group consisting of alkyl, aryl, cyclic and heterocyclic, and R is as defined above. Preferably, the N-fluoroammonium salts of this invention are prepared in the presence of an inert solvent.

3,620,689

PREPARATION OF ALKALI METAL HEXAFLUOROCHLORATES

John P. Faust, Hamden; Albert W. Jache, North Haven, and Andrew J. Klanica, Cheshire, all of Conn., assignors to Olin Mathieson Chemical Corporation

Filed Aug. 20, 1965, Ser. No. 482,329
Int. Cl. C01c 7/24; C01d 11/00
U.S. Cl. 23—367 3 Claims

Process for preparing alkali metal hexafluorochlorates having the formula $MClF_6$ where M is potassium, rubidium or cesium which comprises reacting MF with chlorine pentafluoride at about 0° to 150° C. and at autogenous pressure in a reaction zone defined by surfaces of nickel fluoride.

3,620,690

SINTERED AUSTENITIC-FERRITIC CHROMIUM-NICKEL STEEL ALLOY

Theodore R. Bergstrom, Little Canada, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 10, 1968, Ser. No. 743,588
Int. Cl. B22f 3/100
U.S. Cl. 29—182 9 Claims

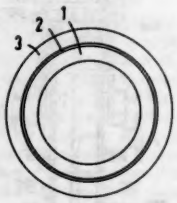
Powdered austenitic chromium-nickel stainless steel is blended with a powdered metal ferrite stabilizer, such as molybdenum, and the resulting blend is sintered to produce a new steel, namely, an unwrought austenitic-ferritic chromium-nickel alloy having, as sintered, desirably high tensile and yield strengths and other desirable properties.

3,620,691

ZIRCONIUM STRUCTURE

Hartmut Rubel, Erlangen, Germany, assignor to Siemens-Aktiengesellschaft

Filed Mar. 26, 1965, Ser. No. 442,960
Claims priority, application Germany, Apr. 11, 1964, Nov. 13, 1964; 590,499, 594,187
Int. Cl. B32b 15/00
U.S. Cl. 29—191 5 Claims



Structure having an inner core comprising a high-strength zirconium alloy, a layer of a gas diffusion-impeding material on the surface of the core and a highly corrosion-resistant zirconium alloy layer engirdling the core and in intimate contact with the gas diffusion-impeding layer.

3,620,692

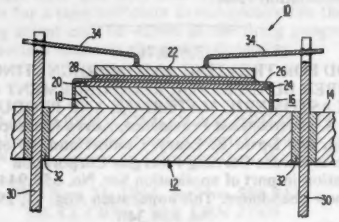
MOUNTING STRUCTURE FOR HIGH-POWER SEMICONDUCTOR DEVICES

David Louis Franklin, Somerville, and Leon Martin Balents, South Bound Brook, both of N.J., assignors to RCA Corporation

Filed Apr. 1, 1970, Ser. No. 24,588
Int. Cl. B32b 15/04
U.S. Cl. 29—195 4 Claims

The structure includes a thick member having a thermal expansion coefficient closely matching that of the device, and a thin metal layer having high thermal diffusivity disposed on the thick member. The metal layer is between 2.0 and 20.0 mils thick, to provide sufficient thermal dif-

fusivity between the device and the thick member, and still allow the thermal expansion coefficient of the structure to be



determined by the thick member. The device is mounted on the exposed surface of the metal layer.

3,620,693

DUCTILE, HIGH-TEMPERATURE OXIDATION-RESISTANT COMPOSITES AND PROCESSES FOR PRODUCING SAME

Lawrence Sama, Seaford, and George T. Pepino, Jr., Huntington Station, both of N.Y., assignors to GTE Electric Incorporated

Filed Apr. 22, 1969, Ser. No. 818,462
Int. Cl. B32b *15/00*

U.S. Cl. 29—195 **3 Claims**

A ductile, high-temperature, oxidation-resistant metal composite is disclosed that comprises a superalloy substrate and a coating composition having the following percentages by weight of ingredients:

chromium	5% to 50%
aluminum	5% to 10%
silicon	0.5% to 3%
cobalt	0% to 5%
nickel	balance

A process for producing the composites is also disclosed wherein the coating composition containing the foregoing ingredients as powdered metals, a fugitive organic binder and a volatile solvent for the binder is applied to a clean substrate and thereafter the coated material is dried and heated under nonoxidizing conditions for a time sufficient to create a diffusion zone between said coating and said substrate.

3,620,694

METHOD FOR REMOVING DISSOLVED OXYGEN FROM HYDROCARBON GELS

Ken Posey, Jr., Allen, Tex., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 16, 1969, Ser. No. 833,789
Int. Cl. C10G *7/02*

U.S. Cl. 44—7 A **3 Claims**

A method of removing dissolved atmospheric oxygen from hydrocarbon liquids and gels which comprises incorporating pyrogallol in the alkaline portion of a three-component flame fuel system consisting of an alkaline portion, a nonalkaline portion, and a hydrocarbon liquid portion. This method effectively reduces swelling of the product formed.

3,620,695

THICKENED COMPOSITIONS AND PROCESS OF PREPARING THEM

Frederic C. McCoy, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,231
Int. Cl. C10l *7/02*

U.S. Cl. 44—7 D **25 Claims**

This invention concerns a process for thickening certain organic liquids comprising admixing the liquid to be thickened with critical rates of reactants comprising:

a. at least one relatively high molecular weight primary monoamine soluble in said liquid,

b. at least one relatively low molecular weight primary monoamine or ammonia, and

c. at least one organic polyisocyanate, until a substantial increase in the viscosity of the liquid is obtained.

3,620,696

FUEL OIL WITH IMPROVED FLOW PROPERTIES

William C. Hollyday, Jr., Watchung, and Nicholas Feldman, Woodbridge, both of N.J., assignors to Esso Research and Engineering Company

Filed Sept. 17, 1968, Ser. No. 760,346
Int. Cl. C10l *1/16, 1/18*

U.S. Cl. 44—62 **7 Claims**

The response of a middle distillate petroleum fuel oil to the addition of a flow improver, such as a copolymer of ethylene, whereby flow and pumpability at low temperatures are improved, is increased by incorporating said fuel oil a small proportion of a paraffinic wax in sufficient quantity to furnish from about 0.03 to about 2 weight percent of normal paraffin hydrocarbons whose average molecular weight is within the range of from 300 to 650. The paraffinic wax that is added has a molar heat of fusion that is greater than the molar heat of fusion of the first wax that separates from the fuel upon cooling to or below its cloud point. Preferably, the added wax contains normal paraffin hydrocarbons ranging from n-C_{24} to at least n-C_{28} inclusive.

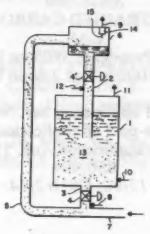
3,620,697

APPARATUS AND METHOD FOR PRODUCING HYDROGEN

Donald K. Wunderlich, Richardson; Finis E. Carleton, Richardson, and Eugene R. Brownscombe, Dallas, all of Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,370
Int. Cl. C10j *3/14, 3/00*

U.S. Cl. 48—89 **12 Claims**



Apparatus and method for producing hydrogen utilizing an inert particulate material as a heat transfer medium, fluidizing the particulate material to convey same to the reaction zone wherein, inter alia, hydrogen is formed, and heating the particulate material while so conveyed.

3,620,698

HYDROGEN AND CARBON MONOXIDE FROM SLURRIES OF SOLID CARBONIFEROUS FUELS

Warren G. Schlinger, Pasadena; William L. Slater, La Habra; Roger M. Dille, La Habra, and Joseph P. Tassoney, Whittier, all of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 787,190
Int. Cl. C01b *2/14;* **C10j** *3/16;* **C10l** *1/32*

U.S. Cl. 48—206 **6 Claims**

Production of synthesis gas from a slurry of particulate solid carboniferous fuels, e.g., petroleum coke, coke from bituminous coal, coal, oil shale, tar sands, pitch, or mixtures of these materials in water or in a hydrocarbon liquid fuel. The amount of particulate solid carboniferous fuel in a pumpable slurry may be increased to 75 wt. percent and the particle size of the solid fuel may be increased to pass through a 12 mesh screen by the addition of 2 to 10 wt. percent of soot as produced, for example, by the partial oxida-

tion of crude oil. The slurry at a relatively low velocity in the range of 5 to 50 feet per second is mixed with a stream of oxidizing gas at a relatively high velocity in the range of 200 feet per second to sonic velocity at the burner tip to form an atomized dispersion of water, hydrocarbon liquid fuel, oxidizing gas, and solid carboniferous fuel. Under synthesis gas-generating conditions, the atomized dispersion is reacted to produce a gaseous mixture of hydrogen and carbon monoxide. By this process, pumpable slurry feeds of low-cost solid carboniferous fuels may be gasified in a synthesis gas generator without being preheated.

3,620,699

REDUCING GAS GENERATION

Blake Reynolds, Riverside, and Clifford G. Ludeman, Darien, both of Conn., assignors to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 668,962, Sept. 19, 1967
Filed Dec. 3, 1969, Ser. No. 879,960
Int. Cl. C01b *2/14*
U.S. Cl. 48—212 **6 Claims**

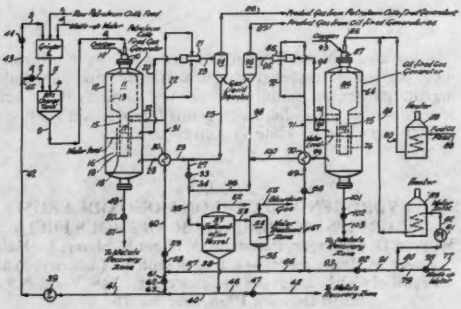
Process for the production of an improved reducing gas comprising essentially H_2+CO and having a minimum "reducing ratio" $(H_2+CO)/(H_2O+CO_2)$ of 15. The reducing gas is generated in a separate unpacked noncatalytic reaction zone by the partial oxidation of a liquid hydrocarbonaceous fuel, substantially in the absence of supplemental H_2O. The temperature in the reaction zone is moderated by a gas mixture having a "reducing ratio" greater than about 1, for example: a portion of cooled reducing gas from the reaction zone; or a portion of the off-gas from an integrated process zone such as an ore reduction zone; or a mixture of both of these gases. In addition to the metallurgical applications, the gas mixtures, as produced by the process of this invention, may be used directly as a fuel gas or as feedstock in processes for the synthesis of methanol, hydrocarbons, or oxygenated organic chemicals.

3,620,700

RECOVERY OF ENTRAINED CARBON IN SYNTHESIS GAS

Warren G. Schlinger, Pasadena; William L. Slater, La Habra; Roger M. Dille, La Habra, and Joseph P. Tassoney, Whittier, all of Calif.

Continuation-in-part of application Ser. No. 787,190, Dec. 26, 1968, Continuation-in-part of application Ser. No. 787,191, Dec. 26, 1968. This application Aug. 15, 1969, Ser. No. 850,404
Int. Cl. B01d *15/00*; C01b *2/14*; C02b *1/14*
U.S. Cl. 48—215 **9 Claims**



Free carbon soot entrained in the product gas of a free-flow synthesis gas generator is recovered in a sedimentation vessel as part of a thickened dispersion of solids in water from which clear supernatant water is easily separated by supplying particulate petroleum coke to the sedimentation vessel or to the reaction zone of said gas generator as a portion of the fuel, or by mixing the carbon soot-water dispersion in the sedimentation vessel with a thickened water slurry of unconverted petroleum coke such as produced by quenching in water the product gas of a second free-flow synthesis gas generator in which the fuel comprises raw particulate petroleum coke and the thickened underflow from said sedimentation vessel.

3,620,701

METHOD FOR TREATING AND IMPREGNATING GLASS FIBER BUNDLES FOR REINFORCEMENT OF ELASTOMERIC MATERIALS AND PRODUCT

Nicholas S. Janetos, East Providence; Alfred Marzocchi, Cumberland, and David E. Leary, Cumberland, all of R.I., assignors to Owens-Corning Fiberglas Corporation

Continuation-in-part of application Ser. No. 655,944, July 25, 1967, now abandoned. This application Aug. 13, 1969, Ser. No. 850,348
Int. Cl. C03c *25/02*
U.S. Cl. 65—3 **18 Claims**

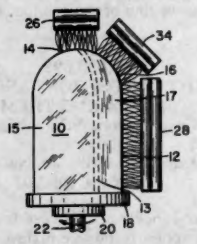
The concepts of this invention reside in the coating of individual glass fibers, in connection with the glass fiber-forming operation, with an elastomeric compatible composition having a curable elastomeric material, followed by at least partial cure of the elastomeric material before the bundle formed of a multiplicity of such coated glass fibers are flexed during processing of the glass fibers in strand, yarn, cord, or fabric formation, whereby the elastomeric-based composition is capable, even when present in an amount as low as 1–4 percent by weight solids, of protecting the coated glass fibers from breaking through the coating during flexure and whereby the bundle formed of the coated glass fibers can be processed to the form desired for use as a reinforcement without seizure or otherwise interfering with the processing steps, after which the bundle is impregnated with an elastomeric-based material for the desirable full loading of the glass fiber bundle to enhance the integration of the reinforcing bundle of glass fibers with the elastomeric matrix in the manufacture of glass fiber-reinforced elastomeric products.

3,620,702

PROCESS IMPROVEMENT FOR MANUFACTURING HIGH-PURITY QUARTZ FORMS

Arthur DeKalb, Danville, Va., and Alan G. Whitney, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 28, 1969, Ser. No. 871,839
Int. Cl. C03b *23/20*, *25/00*
U.S. Cl. 65—18 **3 Claims**



Improvement during the step of firing a high-purity quartz form whereby the end-supported green quartz form is heated

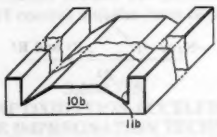
along at least one narrow-band section by a heat source capable of at least attaining the melting point of quartz and the supported form and heat source are moved relative to one another for a time sufficient to completely fire the form. The moving speed may be varied as the firing progresses in order to maintain optimum dimensional stability.

3,620,703

METHOD OF FABRICATING GLASS ORIFICE PLATES

James W. Evans, Corning, and Robert G. Foster, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 25, 1966, Ser. No. 596,942
Int. Cl. C03b *23/20;* C03c *27/06*
U.S. Cl. 65—42 10 Claims



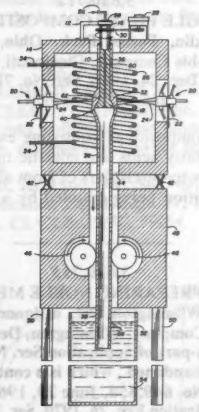
A method of forming blanks or workpieces into members each having a minute hole or orifice and especially an orifice having an unusual or uncommon shape extending therethrough. The orifice in each formed member of a group of such members is geometrically congruent to that of each of the other members of such group and the members of the group may, for example, be used in the fabrication of one or more orifice plates which may be employed as spinneret or filter plates.

3,620,704

METHOD AND APPARATUS FOR FORMING AND DRAWING FUSED METAL-OXIDE TUBES

Foster Lee Gray, Dallas, Tex., assignor to Texas Instrument Incorporated, Dallas, Tex.

Filed Dec. 18, 1969, Ser. No. 886,060
Int. Cl. C03b *17/04*
U.S. Cl. 65—86 18 Claims



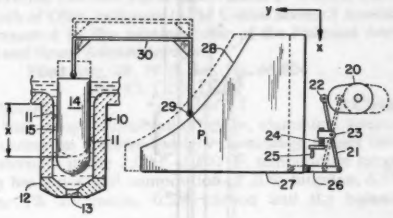
A technique and apparatus for forming a fused metal-oxide structure, for example a fused silica tubing, by depositing a metal oxide on a deposition mandrel by vapor phase hydrolysis, heating the thus-deposited metal to a temperature sufficiently high to form a viscous glass melt, and drawing the structure from this glass melt.

3,620,705

METHOD AND APPARATUS FOR FEEDING MOLTEN GLASS

Stuart M. Dockerty, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 15, 1968, Ser. No. 752,883
Int. Cl. C03b *5/26*
U.S. Cl. 65—129 7 Claims



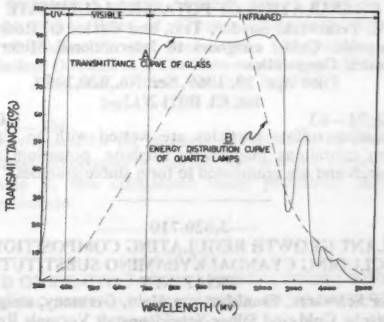
A system for accurately controlling the periodic charging of low-viscosity glass downwardly through an orifice while maintaining zero flow at the orifice intermediate the charging cycles. A needle member is positioned with a tubular well extending below the glass level of a feeder. A parabolic cam surface imparts vertical movement to the needle through a cam follower to alternately feed a desired charge volume from an orifice in the lower end of the well and maintain zero flow between charges. A defined portion of the parabolic cam surface is presented to the cam follower to vary the volume of the charge while maintaining constant cycle time. This is accomplished by a pivotal arm which is provided with a roller follower at its end which follows a constant velocity rotating cam. A rack is connected to the other end of the arm and the rack engages a pinion. The parabolic cam surface rotates in response to the pinion.

3,620,706

METHOD OF THERMAL TEMPERING TRANSPARENT GLASS BODIES

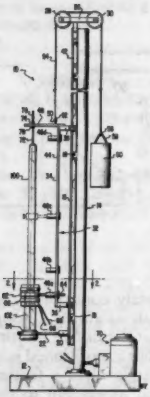
Louis Spanoudis, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Nov. 20, 1967, Ser. No. 690,043
Int. Cl. C03b *27/00*
U.S. Cl. 65—114 1 Claim



This invention relates to an improved method for effecting the thermal tempering of a transparent glass body, particularly a body having walls of varying thickness, by subjecting such body to shortwave infrared energy to which the body is substantially transparent, so that absorption of such radiation occurs throughout the entire mass of the glass body. When the glass body is thus uniformly heated to a desired temperature, it is quenched by subjecting the body to the action of a cooling fluid.

3,620,707
GLASS-TUBE REFORMING APPARATUS
Frans M. Van Damme, Blacksburg, Va., assignor to Research Corporation, New York, N.Y.
Filed Sept. 15, 1969, Ser. No. 857,888
Int. Cl. C03b 23/08
U.S. Cl. 65—271 1 Claim



Apparatus is provided for converting glass tubes of circular cross section into tubes of larger cross-sectional dimensions and of any desired cross-sectional configuration such as square, rectangular, ovoidal, or triangular.

3,620,708
LIQUID FERTILIZERS INCLUDING SOLUBLE ZINC FROM ZINC OXIDE
Louis E. Ott, St. John, Ind., assignor to Standard Oil Company, Chicago, Ill.
Filed May 6, 1970, Ser. No. 35,240
Int. Cl. C05b , 7/00, 21/00
U.S. Cl. 71—33 13 Claims

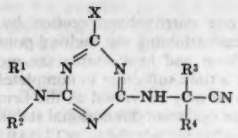
Ammonia-basic aqueous zinc-ammonium-phosphate solutions, containing up to about 20 weight percent zinc from zinc oxide, provide soluble zinc in liquid fertilizers. The solution is at least 15 percent by weight water and includes 0.3–0.52 mols P_2O_5 per mol of zinc and at least 2.4 mols of ammonia per mol of zinc.

3,620,709
GRANULATION OF POTASSIUM SULPHATE
John M. Petkovsek, Snyder, Tex., and Carlos O. Rodriguez, Sunnyvale, Calif., assignors to International Minerals & Chemical Corporation
Filed Apr. 29, 1969, Ser. No. 820,295
Int. Cl. B01j 2/12
U.S. Cl. 71—63 6 Claims

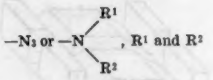
Potassium sulfate particles are wetted with an aqueous solution containing magnesium sulphate, potassium sulfate and starch and are granulated to form stable granules.

3,620,710
PLANT GROWTH REGULATING COMPOSITIONS INCLUDING CYANOALKYLAMINO SUBSTITUTED TRIAZINES
Werner Schwarze, Frankfurt am Main, Germany, assignor to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany
Division of Ser. No. 684,514, Nov. 20, 1967, Pat. No. 3,505,325, Continuation-in-part of application Ser. No. 652,036, July 10, 1967, now abandoned.
Filed Dec. 12, 1969, Ser. No. 884,733
Claims priority, application Germany, July 16, 1966, Nov. 22, 1966; D 50 605, D 51 608
Int. Cl. A01m 9/22
U.S. Cl. 71—93 17 Claims

Herbicidal composition comprising, in an agriculturally acceptable carrier, compounds of the formula



wherein X is a halogen atom, lower alkoxy, lower alkyl mercapto,



being hydrogen, lower alkyl, lower alkenyl, or lower alkyl or alkenyl substituted with —OH, —OR, —SR or —CN, R being lower alkyl, and wherein one of R^3 and R^4 is alkyl or alkenyl having from one to eight carbon atoms and wherein R^3 and R^4 together with the adjoining carbon atom form a five to seven membered cycloalkyl ring; and a method of regulating growth of plants therewith.

3,620,711
HERBICIDAL PROCESS AND COMPOSITIONS FOR USE THEREIN
Brian Graham White, Bracknell, England, assignor to Imperial Chemical Industries Limited, London, England
Filed July 11, 1968, Ser. No. 743,943
Claims priority, application Great Britain, July 18, 1967, 32,934/67
Int. Cl. A01n 9/12, 9/22
U.S. Cl. 71—94 9 Claims

Herbicidally effective complexes of 4,4′- and 2,2′-bipyridylium quaternary salts with salts of transition metals.

3,620,712
SINGLE PHASE COMPOSITION
Edward J. Conklin, Forest Park, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Dec. 24, 1968, Ser. No. 786,761
Int. Cl. A01n 9/24
U.S. Cl. 71—106 10 Claims

Single phase compositions consisting essentially of methyl esters of C_6–C_{12} fatty acids and specific nonionic emulsifiers in a ratio of esters to emulsifiers of from about 1:1.2 to about 3:1, said composition being coupled by a critical amount of water.

3,620,713
PROCESS OF PREPARING NOBLE METAL POWDERS
Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 756,358, Aug. 30, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 649,858, June 29, 1967, now abandoned.
This application Feb. 26, 1970, Ser. No. 14,631
Int. Cl. B22f 9/00; C22b 11/04
U.S. Cl. 75—0.5 A 6 Claims

Acid chloride solutions of noble metals are prepared; the metal is precipitated as a metal-ammonia complex and then reduced to yield a relatively coarse noble metal precipitate powder. Metallization compositions containing the noble metal powders are printed and fired to form various electrical circuit components.

3,620,714

PROCESS OF PREPARING NOBLE METAL ALLOY POWDERS

Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 873,055, Oct. 31, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 705,305, Feb. 14, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 626,394, Mar. 28, 1967, now abandoned. This application Feb. 26, 1970, Ser. No. 14,630

Int. Cl. B22f 9/00; C22b 11/04

U.S. Cl. 75—0.5 A 6 Claims

A method of preparing alloy powders which exhibit low, if any, catalytic activity. Acid chloride solutions of noble metals are prepared; the metal alloy is precipitated as an alloy-ammonia complex and then reduced to yield a relatively coarse noble metal alloy precipitate powder. The important process parameters include the particular chemical reagents utilized, pH control and the rates of precipitation and reduction.

3,620,715

STEEL SCRAP OXIDATION ACCELERATION BY SURFACE IMPREGNATION TECHNIQUES

Sanaa E. Khalafalla, and Sequoya L. Payne, both of Minneapolis, Minn., assignors to The United States of America as represented by the Secretary of the Interior

Filed July 24, 1969, Ser. No. 844,648

Int. Cl. C21b 1/00; C23f 7/04

U.S. Cl. 75—1 7 Claims

The surface of scrap steel from discarded auto bodies, etc. is impregnated with minute amounts of an oxide of an oxidation acceleration agent containing said agent in its highest valence state by immersion in a solution of the agent or by spraying. After such treatment the steel will be rapidly oxidized during a reduction-roasting operation.

3,620,716

MAGNESIUM REMOVAL FROM ALUMINUM ALLOY SCRAP

Paul D. Hess, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 27, 1969, Ser. No. 828,338

Int. Cl. C22b 21/06

U.S. Cl. 75—68 3 Claims

Magnesium can be removed from secondary aluminum by contacting the melted metal with an effective amount of a flux containing potassium aluminum fluoride. This flux offers cost advantages over the known aluminum fluoride flux.

3,620,717

WELDABLE, ULTRAHIGH TENSILE STEEL HAVING AN EXCELLENT TOUGHNESS

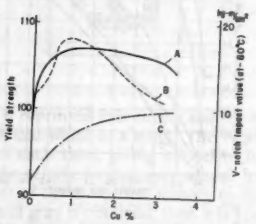
Shozo Sekino; Toshiyuki Fujishima, and Hiroshi Yada, all of Kitakyushu, Japan, assignors to Yawata Iron & Steel Co., Ltd., Tokyo, Japan

Filed Sept. 23, 1968, Ser. No. 761,474

Claims priority, application Japan, Sept. 27, 1967, 42/62125

Int. Cl. C22c 39/50, 39/54

U.S. Cl. 75—125 10 Claims



A weldable, ultrahigh tensile steel prepared by adding V and Cu to a low-carbon steel containing Ni and Mo, to which there may be further added W, Nb and Ta, characterized by being able to stand a low temperature and possessing a good weldability and an excellent toughness at a very high level of the strength, particularly the toughness in the welding heat-affected zone, said properties being particularly imparted by the addition of V and Cu.

3,620,718

NICKEL BASE ALLOY

John C. Freche, Fairview Park, and William J. Waters, Cleveland, both of Ohio, assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 28, 1970, Ser. No. 68,024

Int. Cl. C22c 19/00

U.S. Cl. 75—170 5 Claims

Nickel base alloys containing tungsten, aluminum, zirconium, and carbon in preferred weight percentage ranges have superior strength in the 2,000°–2,200° F. temperature range. This alloy has a nominal composition of 20% tungsten, 6.5% aluminum, 1% zirconium, 0.2% carbon and the balance nickel.

3,620,719

METHOD OF VACUUM REFINING HIGH-TEMPERATURE ALLOYS

Harold L. Wheaton, Kinsington, and Edward G. Pekarek, Willoughby, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Nov. 12, 1969, Ser. No. 876,107

Int. Cl. C22c 1/02

U.S. Cl. 75—170 12 Claims

Covers a method of making nickel-base alloys characterized by markedly improved rupture ductility particularly in the intermediate temperature range. This includes the steps of charging to a furnace crucible a base charge of carbon and a mixture of nonreactive metals comprising at least nickel, vacuum refining said charge by heating it to a melt at a temperature ranging from about 2,550° F. to about 2,750° F. at a pressure less than 50 microns and completing said refining by further heating the charge to a melt temperature ranging from about 2,800° F. to about 3,000° F. for a period of time until carbon deoxidation is complete. The melt is cooled, at least one reactive metal added thereto, and the nickel alloy is then teemed.

3,620,720

PROCESS FOR PRODUCING METALLIC MATERIALS CONTAINING THORIA

Philippe Galmiche, Clamart; Andre R. Hivert, Pontoise, and Michel E. Marty, Paris, all of France, assignors to Office National D'Etudes Et De Recherches Aerospatiales (par abreviation: O.N.E.R.A.), Chatillon-sous-Bagneux, France

Filed Mar. 1, 1968, Ser. No. 709,794

Int. Cl. C22c 39/50

U.S. Cl. 75—206 8 Claims

The thoria used for the dispersion is obtained by pyrolysis of a chelated compound of thorium whose anion comes from a diketone β, this compound being preferably thorium acetylacetoneate.

3,620,721

LEAD OXIDE-CONTAINING PHOTOCONDUCTIVE RECORDING PROCESS UTILIZING X-RAYS OR VISIBLE LIGHT

Bernard Hippoliet Tavernier, Edegem; Nikolaas Cyriel De Jaeger, Wommelgem, and Johannes Josephus Vanheertum, Halle-Zandhoven, all of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Aug. 22, 1969, Ser. No. 852,503

Claims priority, application Great Britain, Aug. 22, 1968, 40,247/68

Int. Cl. G03g 5/08

U.S. Cl. 96—1 5 Claims

Photosensitive recording materials highly sensitive to X-ray and visible light are produced by mechanically fragmenting

crystalline orthorhombic lead (II) oxide or a crystalline mixture thereof with tetragonal lead (II) oxide in a ratio of up to about 20:80 to a grain size of about 0.1–0.5 microns with a content of about 20–95 percent tetragonal lead (II) oxide and the balance orthorhombic lead (II) oxide, and dispersing such grains in an electrostatic charge-retaining insulating binder medium.

3,620,722

SENSITIZED DEVELOPERS FOR ELECTROPHOTOGRAPHY AND ELECTRORADIOGRAPHY

Peter J. Hastwell, Elizabeth Grove, and Kenneth A. Metcalfe, Lockleys, both of Australia, assignors to The Commonwealth of Australia care of the Secretary, Department of Supply, Parkes, Canberra, Australia

Filed Sept. 18, 1968, Ser. No. 760,733
Claims priority, application Australia, Sept. 18, 1967, 27289
Int. Cl. G03g *13/00*; **B05c** *1/16*
U.S. Cl. 96—1.2 **2 Claims**

The invention relates to a method of correcting the surface of a photoconductor during multicolor development processes wherein the sensitivity to color acceptance during exposure is varied by the developer of the previous steps, the invention residing in the color correction between development and exposure steps of either the whole surface or the image surface only by either including with a developer, or applying independently, a sensitizing dye in the next color exposure.

3,620,723

ELECTROPHOTOGRAPHIC COPYING MATERIAL CONTAINING ASSISTANT SENSITIZERS AND ITS MANUFACTURING METHOD

Nario Yamaguchi, and Kazuo Tubuko, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed May 15, 1968, Ser. No. 729,228
Claims priority, application Japan, May 29, 1967, 42/33663
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.5 **7 Claims**

An electrophotographic copying material, comprising a support sheet having a front and a reverse side, said reverse side having been given an electroconducting treatment and said front side being impregnated with or directly coated with as assistant sensitizer, said front side further having, on the face of the assistant sensitizer applied on said side, a light-sensitive layer (photoconductive layer) containing an organic photoconductive substance. A method for manufacturing the aforesaid copying material, comprising first applying a solution of an assistant sensitizer onto the front side of a support sheet with its reverse side already having been given an electroconducting treatment, drying the applied assistant sensitizer at a temperature ranging from 60° C. to 100° C, and then forming a light-sensitive layer on the face of the applied assistant sensitizer.

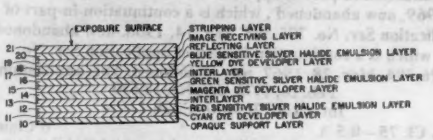
3,620,724

PHOTOGRAPHIC COLOR DIFFUSION TRANSFER PROCESSES AND ELEMENTS FOR USE THEREIN

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 519,995, Jan. 11, 1966, which is a continuation-in-part of application Ser. No. 368,662, May 19, 1964, now Patent No. 3,332,369. This application Jan. 19, 1970, Ser. No. 003,645
Int. Cl. G03c *7/00*, *5/54*
U.S. Cl. 96—3 **44 Claims**

The present invention is directed, in general, to a photographic film unit, specifically adapted for employment in photographic diffusion transfer color processes, which comprises a photosensitive laminate containing a dimensionally stable support carrying on one surface a dyeable polymeric layer and a photosensitive silver halide emulsion layer having associated therewith a dye image-providing material which is processing composition diffusible as a function of the emulsion's exposure to incident actinic radiation, and, positioned intermediate the dyeable polymeric layer and the photosensitive silver halide emulsion layer and associated dye image-providing material, a layer permeable to processing composition solubilized dye image-providing material comprising visible light-reflecting agent in a concentration effective to mask



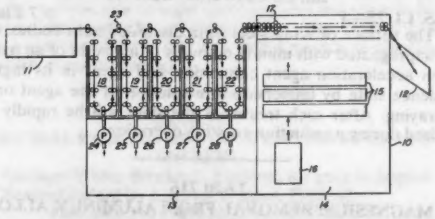
the dye image-forming material associated with the photosensitive silver halide emulsion layer, subsequent to processing, and insufficient to prevent exposure of the emulsion layer by incident actinic radiation, and to photographic diffusion transfer color processes employing the film unit.

3,620,725

RAPID PHOTOGRAPHIC DEVELOPMENT SYSTEM

John A. Kosta, Dayton, Ohio, assignor to Technology Incorporated, Dayton, Ohio

Filed Jan. 23, 1969, Ser. No. 793,509
Int. Cl. G03c *5/50*, *5/24*
U.S. Cl. 96—22 **10 Claims**



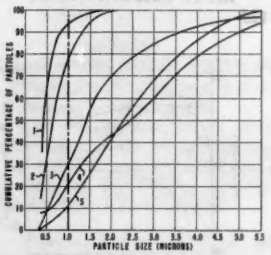
A rapid photographic developing process for color photography which comprises passing a latent-image-bearing film or print sequentially through a developer bath, a stop bath, a bleach-fix bath, a water bath, and a stabilizer bath. The components of the baths are balanced so that the process may be carried out at temperatures of 85° to 95° F. or higher to obtain rapid and consistently good results.

3,620,726

PROCESS USING COLORED PARTICLES TO DEVELOP PHOTOHARDENABLE IMAGING LAYERS

Victor Fu-Hua Chu, East Brunswick, and Charles Walter Manger, Irvington, both of N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1968, Ser. No. 701,487
Int. Cl. G03c *5/04*, *1/68*, *11/12*
U.S. Cl. 96—27 R **7 Claims**



An improved image reproduction process in which an element having a support and a photohardenable layer, after

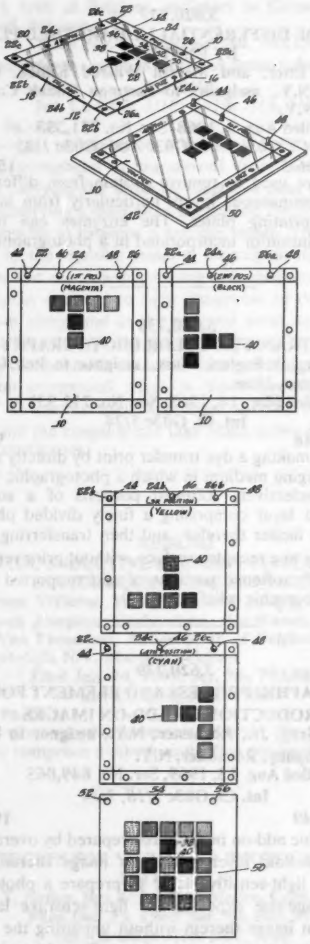
imagewise exposure to actinic radiation to harden the layer in exposed areas without hardening in the underexposed areas, is colored only in the underexposed areas by dusting it or bringing it into contact with a surface bearing loosely bound colorant, the improvement being in the use of colorant having a particle size distribution within the range 0.2–30 microns with not more than 50 percent of particles being of less than 1 micron equivalent spherical diameter.

3,620,727

METHOD FOR DETERMINING PROPER COLOR BALANCE IN COLOR PRINTING BASE

Joseph J. Smajo, Chicago, Ill., assignor to Opto/Graphics, Inc., Kenilworth, Ill.

Filed July 28, 1969, Ser. No. 845,288
Int. Cl. G03c *5/04; G01j 3/46*
U.S. Cl. 96—27 E **4 Claims**



A step-wedge is reprinted four times, one for each of three colors plus black and white as a mask. The reprinting is in a different position each time, giving a total of four different positions with one selected value overprinted by each color to show the effect of the overprint, namely to demonstrate a neutral. If a neutral gray is obtained, then it is known that the printing is correct. If no neutral is obtained, a ready reference, not requiring the use of a densitometer or separation filters is immediately at hand.

3,620,728

RECEIVING SHEET FOR DIFFUSION TRANSFER PROCESSES

David Alan Cottingham, Northwood, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,358
Claims priority, application Great Britain, Apr. 3, 1969, 17,609/69
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 **10 Claims**

A receiving sheet for diffusion transfer processes wherein the image-receiving layer contains as the binding agent a mixture of an alkali metal salt of carboxymethyl cellulose and a propylene glycol ether-substituted methyl ether of cellulose and a process for using the receiving sheet. The novel mixture of binders provides an improved positive which effects more rapid image-transfer, better tone and combines ease of sandwich separation with immediate dry feel.

3,620,729

ELECTROPHOTOGRAPHIC COATING COMPOSITIONS EMPLOYING STYRENE TERPOLYMERS AS BINDERS

Dilip K. Ray-Chaudhuri, Somerset; Paul C. Georgoudis, Dunellen, and Stanley Field, Piscataway, all of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,959
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.8 **10 Claims**

Photoconductive coating compositions for application to solid substrates which are to be utilized in electrophotographic operations are described; the resultant photoconductive coatings comprise a layer of photoconductive pigment particles bonded to themselves and to the solid substrate with a styrene terpolymer.

3,620,730

NOVEL PRODUCTS AND PROCESSES FOR FORMING IMAGES IN SILVER AND IN DYE

Russell P. Cook, Wellesley, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 29, 1969, Ser. No. 861,767
Int. Cl. G03c *5/54*
U.S. Cl. 96—3 **16 Claims**

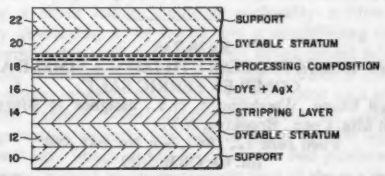
Novel procedures for forming an image both in dye and in silver wherein an exposed silver halide layer containing a developable image is developed and as a function of development an imagewise distribution of dye is transferred to a dyeable stratum contiguous with said silver halide layer, whereby to form an image both in developed silver and in transferred dye.

3,620,731

NOVEL PROCESSES FOR FORMING TWO NEGATIVE COLOR TRANSFER IMAGES

Joel M. Peisach, Hudson, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 29, 1969, Ser. No. 861,766
Int. Cl. G03c *5/54*
U.S. Cl. 96—3 **10 Claims**



Novel systems for preparing a pair of negative images, utilizing film units including a layer of a light-sensitive silver halide, a color-providing material disposed in this layer or in an adjacent layer, which color-providing material is nondif-

fusible, but, upon oxidation, can release a diffusible color-providing moiety for transfer, said film unit further including a dyeable stratum separable from the aforementioned layer or layers.

3,620,732

PROCESS FOR THE PREPARATION OF WATER-INSOLUBLE REPRODUCTION LAYERS AND FOR THEIR SUBSEQUENT IMAGE-WISE DIFFERENTIATION

Hartmut Steppan, Wiesbaden-Dotzheim; Karl Josef Rauterkus, Kelkheim, and Detlev Seip, Hofheim/Tanus, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Jan. 15, 1968, Ser. No. 697,621

Claims priority, application Germany, Jan. 18, 1967, F 51275

Int. Cl. G03c *1/68, 1/70*

U.S. Cl. 96—33 **13 Claims**

This invention relates to a process for the preparation of water-insoluble reproduction layers and also a process for the use of such layers. In the process of preparation, a suitable support is coated with an aqueous dispersion of a water-insoluble, inherently light-sensitive polymer, and the coated dispersion is solidified into a film, with simultaneous removal of the water. In the process for using the film, the latter is imagewise exposed to light and then imagewise differentiated by means of a developing process.

3,620,733

LIGHT-SENSITIVE REPRODUCTION LAYER AND PROCESS

Hartmut Steppan, Wiesbaden-Dotzheim; Gunter Messwarb, Kelkheim, and Walter Luders, Neu-Isenburg, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Jan. 15, 1968, Ser. No. 697,636

Claims priority, application Germany, Jan. 18, 1967, F 51271

Int. Cl. G03c *1/68, 1/70*

U.S. Cl. 96—33 **34 Claims**

The present invention relates to a light-sensitive reproduction layer and a process for utilizing the layer, the layer comprising or consisting of a light-sensitive copolymer of at least one vinyl monomer, which by itself yields water-soluble polymers, with at least one light-sensitive monomer containing a ketone group.

3,620,734

POSITIVE-WORKING PHOTOPOLYMERIZATION PROCESS

Edward J. Cerwonka, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Sept. 9, 1968, Ser. No. 758,606

Int. Cl. G03c *5/00*

U.S. Cl. 96—35.1 **9 Claims**

A process of photopolymerizing monomers comprising contacting said monomers with a light-sensitive diazonium salt exposing the composition to actinic radiation and subsequently immersing the composition in a processing bath which comprises a compound selected from the group consisting of ferrous ammonium sulfate or hydroquinone.

3,620,735

RELIEF IMAGE PROCESS UTILIZING A SIMPLE AND A COMPLEX FERRIC SALT

Bernard Ulano, Woodsburgh, N.Y., assignor to Diagravure Film Mfg. Corp., Brooklyn, N.Y.

Filed June 12, 1967, Ser. No. 645,488

Int. Cl. G03c *5/00*

U.S. Cl. 96—36 **2 Claims**

A photosensitive composition for making relief images and a process for utilizing said composition is provided. The composition comprises an insolublizable water-soluble binder, a water-soluble photosensitive simple ferric salt, for example, ferric chloride or ferric oxalate, and an inhibitor for the ferric salt, for example, ammonium, sodium, potassium or lithium oxalates, ammonium ferric oxalate or tartrate.

3,620,736

PHOTOFABRICATION SYSTEM USING DEVELOPED NEGATIVE AND POSITIVE IMAGES IN COMBINATION WITH NEGATIVE-WORKING AND POSITIVE-WORKING PHOTORESIST COMPOSITIONS TO PRODUCE RESISTS ON OPPOSITE SIDES OF A WORKPIECE

Raife G. Tarkington, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1969, Ser. No. 863,719

Int. Cl. G03c *5/00, 5/54*

U.S. Cl. 96—36 **12 Claims**

Image layers bearing developed negative and positive images, are employed in combination with negative-working and positive-working photoresist compositions to produce resists on opposite sides of a workpiece.

3,620,737

ETCHING OF DIFFERENTIALLY HARDENED PLATES BY ENZYMES

Doyle Owen Etter, and Merrill Wilfred Killick, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1968, Ser. No. 751,353

Int. Cl. G03c *5/00;* **G03f** *7/00;* **G03c** *1/02*

U.S. Cl. 96—36.3 **15 Claims**

Enzymes are used to remove protein from differentially hardened proteinaceous layers particularly from layers on lithographic printing plates. The enzymes can be in a processing solution or incorporated in a photographic emulsion.

3,620,738

DYE TRANSFER COLOR PHOTOGRAPHY

Hans K. Wong, Arlington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 14, 1968, Ser. No. 712,931

Int. Cl. G03c *5/24*

U.S. Cl. 96—48 **9 Claims**

Method of making a dye transfer print by directly applying dye to an imaging medium in which a photographic image is defined by selectively softened portions of a supported photosensitive layer comprising a finely divided photoconductor and a binder therefor, and then transferring applied dye therefrom to a receptor surface, without prior removal of said selectively softened portions of said supported layer to create a photographic relief image.

3,620,739

PHOTOGRAPHIC PROCESS AND ELEMENT FOR THE PRODUCTION OF ADD-ON IMAGES

William C. Gray, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,865

Int. Cl. G03c *5/18, 7/34*

U.S. Cl. 96—49 **19 Claims**

Photographic add-on images are prepared by overcoating a hydrophilic colloid layer having an image therein with a hydrophobic light-sensitive layer to prepare a photographic element, imagewise exposing the light-sensitive layer and developing an image therein without impairing the underlying hydrophilic image-containing layer. The add-on images so produced are susceptible of convenient removal by treatment of the hydrophobic layer with a solvent which is not a solvent for the hydrophilic colloid layer. Alternatively, when a hydrophobic strippable layer is interposed between the hydrophobic layer and light-sensitive hydrophobic layer, the hydrophobic layers including the add-on photographic image can be removed by physically stripping them from the hydrophilic layer. Image removal is accomplished without substantially impairing the image in the hydrophilic colloid layer.

3,620,740

THERMODIAZO-TYPE COPYING

Albert Lucien Poot, Kontich, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Jan. 9, 1969, Ser. No. 790,148
Claims priority, application Great Britain, Jan. 9, 1968, 1,322/68
Int. Cl. G03c 5/18; B41m 5/18, 5/22
U.S. Cl. 96—49 15 Claims

Diazo-type reproduction using as a latent diazonium coupling compound activable by heat an 3H-indolium compound.

3,620,741

DIAZO-TYPE COPYING

Albert Lucien Poot, Kontich, and Rene' Alois van Brandt, Kessel, both of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Jan. 9, 1969, Ser. No. 790,150
Claims priority, application Great Britain, Jan. 9, 1968, 1,320/68
Int. Cl. G03c 5/18; B41m 5/18, 5/22
U.S. Cl. 96—49 9 Claims

Diazo-type reproduction wherein a 3-H-indoline color-coupling compound is transferred from a transfer sheet material carrying the same by means of heat to a receiving material carrying a diazonium compound for imagewise reaction therewith to produce a azo dye image. The heat can be applied to the transfer material directly in the form of an image or the diazonium carrying receiving material can be preliminarily exposed to light imagewise to decompose the diazonium compound in the exposed areas with heat being uniformly applied to the transfer material to transfer the coupling compound for reaction with residual undecomposed diazonium compound. Heat in the temperature range of 80–140° C. can be used with these specific coupling compounds and the coupling can take place under acid as well as alkaline conditions.

3,620,742

PHOTOCONDUCTIVE ELEMENT CONTAINING A DIHYDROQUINOLINE POLYMER

Jozef Frans Willems, Wilrijk; Robert Joseph Noe, Mortsel; Johannes Josephus Vanheertum, Zandhoven, and August Jean Van Paesschen, Antwerp, all of Belgium, assignor to Gevaert-Agfa N.V. Mortsel, Belgium

Filed Jan. 24, 1969, Ser. No. 793,881
Int. Cl. G03g 5/00, 7/00
U.S. Cl. 96—1.6 23 Claims

Electrophotographic materials wherein the photoconductive layer comprises a dihydroquinoline polymer.

3,620,743

VEHICLES FOR VESICULAR PHOTOGRAPHIC MATERIALS

Norman T. Notley, Box 462, Sierre Madre, Calif.

Filed Dec. 15, 1969, Ser. No. 885,371
Int. Cl. G03c 5/18, 1/52, 5/00
U.S. Cl. 96—49 9 Claims

This invention is directed to a light-sensitive vesicular-imaging composition comprising an essentially chloroacrylonitrile polymer, including copolymers of chloroacrylonitrile with a different vinyl monomer and intimate mixtures with other organic materials, coated as a thin film and having intimately dispersed therein a sensitizer which liberates gas on irradiation. Upon irradiation of this novel composition with a pattern of actinic radiation, gas released in the selected areas may be developed to a superior image by overall heating.

3,620,744

DYESTUFF-BLEACHING PREPARATION FOR THE PHOTOGRAPHIC SILVER DYESTUFF-BLEACHING PROCESS

Matthias Schellenberg, Fribourg, and Max Marthaler, Marly-le-Petit, both of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed June 18, 1969, Ser. No. 834,445
Claims priority, application Switzerland, June 25, 1968, 9404/68
Int. Cl. G03c 7/00
U.S. Cl. 96—53 5 Claims

In a photographic silver dyestuff-bleaching process a dyestuff-bleaching preparation is used which contains an acid, a water-soluble iodide, optionally a dyestuff-bleaching catalyst and in addition a reductone such as ascorbic acid. These preparations, preferably in the form of baths, are distinguished by their stability and effectiveness even after prolonged storage in open containers.

3,620,745

COLOR PHOTOGRAPHIC SILVER HALIDE EMULSIONS OF DIFFERENT DEVELOPING SPEED ONE LAYER HAVING A DIR COUPLER

Merrill W. Seymour, East Orleans, Mass., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1968, Ser. No. 717,924
Int. Cl. G03c 1/76
U.S. Cl. 96—68 19 Claims

A photographic material comprising a support coated with (1) a first light-sensitive layer containing a silver halide emulsion preferably a coarse grain emulsion either alone or with a colorless nondiffusing color-forming coupler that forms a nondiffusible dye upon color development and (2) a second light-sensitive layer containing a finer grain rapidly developing silver halide emulsion and a colorless nondiffusing development inhibitor releasing coupler that forms a dye and a diffusible development inhibitor upon color development by a primary aromatic amine color developing agent, is used advantageously to record a first light image in the first layer and a second light image in the second layer and produce upon color development an image reproduction of the second light image in the second layer and only produce a visible image reproduction of the first light image in the first layer that is not directly under (or over) the image reproduction in the first layer, such that the two image reproductions are vividly different.

3,620,746

COLOR PHOTOGRAPHIC MATERIAL COMPRISING NONDIFFUSING COUPLER AND DIR HYDROQUINONE

Charles R. Barr, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1968, Ser. No. 717,923
Int. Cl. G03c 1/76
U.S. Cl. 96—3 20 Claims

A photographic material comprising a support coated with (1) a first light-sensitive layer containing a silver halide emulsion preferably a coarse grain emulsion either alone or with a nondiffusing color-forming coupler that forms a dye upon color development and (2) a second light-sensitive layer containing a silver halide emulsion preferably a finer grain rapidly developing silver halide and a nondiffusing coupler that forms a dye, and a nondiffusible development inhibitor-releasing hydroquinone compound that releases a diffusible development inhibitor upon color development by a primary aromatic amine color developing agent, is used advantageously to record a first light image in the first layer and a second light image in the second layer and produce upon color development an image reproduction of the second light image in the second layer and produce a visible image reproduction of the first light image in the first layer, said visible image reproduction having reduced contrast in areas that correspond to the image reproduction formed in the said second layer.

3,620,747

PHOTOGRAPHIC ELEMENT INCLUDING SUPERIMPOSED SILVER HALIDE LAYERS OF DIFFERENT SPEEDS

John C. Marchant, Hamlin, and Robert F. Motter, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1968, Ser. No. 730,593
Int. Cl. G03c 1/76, 1/40
U.S. Cl. 96—74 10 Claims

Photographic elements are provided which feature a support having coated thereon a first photographic silver halide emulsion layer containing image-forming coupler and development inhibitor-releasing coupler; and, a second silver halide emulsion layer containing photographic image-forming coupler, the second layer having a faster effective speed sensitivity than the first layer. Such elements have high contrast for faint images and an extended latitude of low contrast for bright images.

3,620,748

N-VINYL AMINE/HALOGEN LIBERATING COMPOSITION SENSITIZED WITH 9-VINYL CARBAZOLES OR POLYACENES, OR TRANSANNULAR PEROXIDES OF POLYACENES

Harry L. Fichter, Jr., Lakewood, Ohio, assignor to Horizons Incorporated, a Division of Horizons Research Incorporated

Filed Jan. 7, 1966, Ser. No. 519,182
Int. Cl. G03c 5/24, 1/72
U.S. Cl. 96—48 7 Claims

The photographic response of compositions comprising mixtures of (1) N-vinyl carbazole (or other N-vinyl amine) and (2) CBr_4 (or other organic halogen compound) to radiant energy having wavelengths longer than 4,500 A. is enhanced so as to include a response to radiant energy having wavelengths of up to about 7,000 A. by adding a slightly colored visible light sensitizer to the mixture.

3,620,749

PHOTOSENSITIVE COMPOSITIONS COMPRISING SILVER COMPLEXES OF 3-SUBSTITUTED-4-THIAZOLINE-2-THIONES AND PHOTOSENSITIVE ELEMENTS COMPRISING SUCH COMPOSITIONS

Grant M. Haist; Wilbert J. Humphlett, and James R. King, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1968, Ser. No. 764,298
Int. Cl. G03c 1/02
U.S. Cl. 96—94 R 23 Claims

Complex silver salts, formed by silver ion with a 3-substituted-4-thiazoline-2-thione which has an active hydrogen in the group substituted at the 3-position, are found to be photosensitive, i.e., capable of forming photographic images by photoexposure and development, useful for making photographic films, plates and the like.

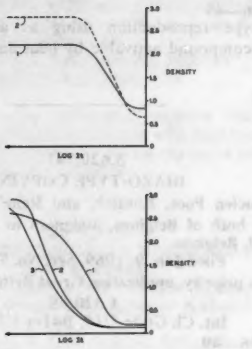
3,620,750

DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING THALLIUM SALT AND MERCURY SALT

Oskar Riester, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 9, 1969, Ser. No. 790,043
Int. Cl. G03c 1/28
U.S. Cl. 96—108 6 Claims

Direct positive photographic silver halide emulsions containing a monovalent thallium salt and/or a monovalent or divalent mercury salt.



3,620,751

PHOTOGRAPHIC LIGHT-SENSITIVE LAYERS CONTAINING POLYMER OF POLYOL ESTER OF UNSATURATED ACID

Miroslav Stol; Richard Chromecek; Vladimir Stoy; Karel Kliment, and Jaroslava Otoupalova, all of Praha, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed June 12, 1968, Ser. No. 736,280
Claims priority, application Czechoslovakia, June 21, 1967, 4540/67
Int. Cl. G03c 1/72
U.S. Cl. 96—114 6 Claims

Usual gelatine is replaced in light-sensitive photographic layers on films, paper, glass and other substrates by noncrosslinked polymers and copolymers of polyol, particularly glycol methacrylates or acrylates or their mixtures, soluble in aqueous cosolvent mixtures but insoluble in water, in which they but swell. According to a special embodiment, said polymers or copolymers are grafted onto gelatine. According to a further embodiment of the invention, silver halides are precipitated directly in said polymers or copolymers grafted on gelatine in cosolvent aqueous mixtures, the suspension thus obtained is precipitated and washed in excess of water, whereafter the purified polymer-silver halide suspension is dissolved and dispersed again in an aqueous cosolvnet mixture, the liquid dispersion is cast onto a solid substrate and the solvent evaporated. According to a still further embodiment the silver halide is first precipitated in an aqueous gelatine solution, separated and dispersed in a solution of a noncrosslinked polymer or copolymer of glycol acrylate or methacrylate, whereafter the dispersion is used for casting light-sensitive layers.

3,620,752

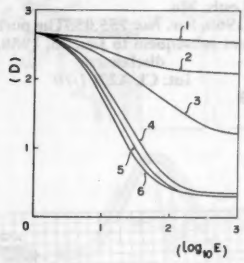
PRECIPITATING SILVER HALIDE IN 0.5 TO 3 PERCENT WEIGHT AQUEOUS GELATIN SOLUTION

Tatsuro Matsuo, 2-772, Shimotakaido, Suginami-ku, Tokyo, Japan

Filed Mar. 12, 1969, Ser. No. 806,377
Int. Cl. G03c 1/72
U.S. Cl. 96—114.7 1 Claim

A method for producing a sensitive material with silver ha-

lide giving directly a positive image by exposing the sensitive



material to the light to throw a desired image on it and then developing it by conventional method.

3,620,753

PROCESS FOR THE MANUFACTURE OF MINERAL CATTLE FOOD

Joseph Cremer, Hermulheim near Cologne; Heinz Harnisch, Lovenich; Friedrich Schulte, Hurth near Cologne, and Arnulf Hinz, Knapsack near Cologne, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, Germany

Filed Dec. 29, 1969, Ser. No. 888,911
Claims priority, application Germany, Dec. 27, 1968, P 18 17 127.2
Int. Cl. A23k *1/00*; C05b *11/00*; C01b *25/32*
U.S. Cl. 99—2 I 15 Claims

Production of mineral cattle food consisting of sodium, magnesium and calcium phosphates, wherein phosphoric acid, dolomite and sodium hydroxide solution are introduced into a long extended reaction zone, conveyed therethrough with constant agitation and reacted therein, and the resulting reaction product is dried.

3,620,754

PROCESS FOR PREPARING A WATER-CONTAINING FEED FOR CULTIVATING MACRURA AND PRODUCT

Tsunetoshi Kanemitsu, and Yukio Asakura, both of Tokyo, Japan, assignors to Taiyo Fishery Co. Ltd., Tokyo, Japan

Filed Feb. 28, 1969, Ser. No. 803,444
Claims priority, application Japan, Feb. 29, 1968, 43/1257
Int. Cl. A01k *85/02*
U.S. Cl. 99—3 4 Claims

This invention discloses a novel composition and the process by which a feed having excellent properties particularly for use in feeding macrura cultivated in nursery is prepared by kneading a mixture of from 40 to 75 percent of a compound fish feed, 15 to 30 percent of starch and 10 to 30 percent of a heat-coagulating protein, adding, before or during kneading, water in the quantity adequate to obtain a final product having a water content of from 50 to 70 percent, and heating the water-containing mixture until it coagulates.

3,620,755

HIGH-PROTEIN FOOD

Harold A. Hoffman, 105 Bayeau Road, New Rochelle, N.Y.

Continuation-in-part of application Ser. No. 525,359, Feb. 7, 1966, now Patent No. 3,485,636, dated Dec. 23, 1969. This application Nov. 26, 1969, Ser. No. 880,354
Int. Cl. A23j *1/14*
U.S. Cl. 99—17 10 Claims

A foodstuff of improved taste and consistency is prepared by impregnating soybean meal with an edible oleaginous material and cooking the resulting material in boiling water.

3,620,756

NONFOAMING AND NONSCUMMING INSTANT COFFEE

Rudolf G. K. Strobel, Colerain Township, and Neil R. Artman, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 17, 1969, Ser. No. 801,246
Int. Cl. A23f *1/04, 1/08*
U.S. Cl. 99—71 10 Claims

Disclosed is a method of eliminating the problem of foam and scum on cups of instant coffee beverage by removal of polyvalent metal cations from the natural components of instant coffee as well as from the water used during extraction by contacting liquid coffee extract with a cationic exchange resin.

3,620,757

REPLACEMENT OF SODIUM CASEINATE

Rudolph H. Ellinger, New Canaan, Conn., and Mark G. Schwartz, Yonkers, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed July 15, 1968, Ser. No. 744,678
Int. Cl. A23c *23/00, 13/12, 19/12*
U.S. Cl. 99—54 23 Claims

Compositions of dry whey solids and alkali polyphosphates are provided which exhibit functional properties in food compositions as well as nutrient value. The polyphosphate is present in an amount of at least one percent based on protein and the polyphosphate desirably has a P_2O_5 content of 66 percent or greater. These compositions are preferably used as replacement, total or partial for sodium caseinate in nonbutterfat dairy products.

3,620,758

PROCESS FOR OBTAINING AN AROMATIZED COFFEE EXTRACT

Herman H. Friedman, Bayside; Esra Pitchon, Flushing; Alexander S. Cascione, Yonkers, and Burton L. Banks, Dobbs Ferry, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 20, 1970, Ser. No. 4,406
Int. Cl. A23f *1/04, 1/08*
U.S. Cl. 99—71 10 Claims

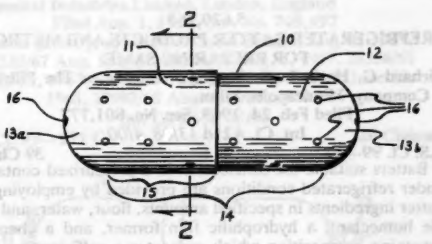
A method of obtaining an aromatized coffee extract wherein the extracting medium is introduced into a column of coffee which has been subjected to steaming under isolated conditions before the column is vented to the atmosphere. In this manner, the extracting medium condenses the aromatic volatiles and when the coffee extract is drawn off from the column it contains, uniformly dispersed therein, the desired aromatic volatiles.

3,620,759

FOOD CAPSULE

V Harold Maddox, Huntington Woods, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Apr. 1, 1969, Ser. No. 811,772
Int. Cl. A23l *1/00*
U.S. Cl. 99—78 9 Claims



A packaged food article for constitution with water (or other aqueous potable liquid) is provided in the form of a perforated hard shell gelatin capsule containing a predetermined quantity of a soluble food extract. The capsule wall is perforated at a number of points spaced over the middle and

both ends of the capsule so that, when a serving of hot water is agitated with the capsule, contact of the article with water is extensive whereby both the container and the contents promptly dissolve to provide refreshment for immediate consumption.

3,620,760

COOK-IN-THE-BOWL CEREAL

Melvin A. Ver Steeg, Jr., and Ferdinand E. Spring, Jr., both of St. Louis, Mo., assignors to Ralston Purina Company, Saint Louis, Mo.

Filed Nov. 25, 1968, Ser. No. 778,478
Int. Cl. A23l *1/10*
U.S. Cl. 99—80 6 Claims

A process of producing a cook-in-the-bowl type of hot breakfast cereal is disclosed. The process involves selecting a specific milled fraction of grain and flaking the grain to a thickness of 0.010 to 0.012 inch. The thin flakes are capable of rehydrating rapidly in boiling water to produce a hot breakfast cereal of the instant or cook-in-the-bowl type.

3,620,761

COOK-IN-THE-BOWL CEREAL

Ferdinand E. Spring, Jr., St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Nov. 25, 1968, Ser. No. 778,477
Int. Cl. A23l *1/10*
U.S. Cl. 99—80 8 Claims

A process of producing a cook-in-the-bowl type of hot breakfast cereal is disclosed. The process involves selecting a specific milled fraction of grain and flaking the grain to a thickness of 0.007 to 0.008 inch. The thin flakes are capable of rehydrating rapidly in boiling water to produce a hot breakfast cereal of the instant or cook-in-the-bowl type.

3,620,762

A PROCESS FOR PRODUCING ENRICHED ARTIFICIAL RICE

Teruo Yoshida, Kanagawa-ken; Takaaki Sagara, Kanagawa-ken; Takashi Ojima, Kanagawa-ken; Reiji Takahashi, Kanagawa-ken, and Masahiro Takahashi, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed June 24, 1969, Ser. No. 836,145
Claims priority, application Japan, July 11, 1968, 43/48687
Int. Cl. A23l *1/30, 1/10*
U.S. Cl. 99—83 5 Claims

Enriched artificial rice is prepared by kneading together rice powder, nutrients (i.e. amino acids, vitamins, and/or minerals), water, and if desired, a binder (such as carboxymethyl-cellulose); steaming the mixture to semigelatinize the starch contained therein; granulating the resulting viscous product; and, if desired, coating the grains obtained.

3,620,763

REFRIGERATED BATTER PRODUCTS AND METHOD FOR PREPARING SAME

Richard G. Hans, Louisville, Ky., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Feb. 24, 1969, Ser. No. 801,777
Int. Cl. A21d *13/08, 4/00*
U.S. Cl. 99—92 39 Claims

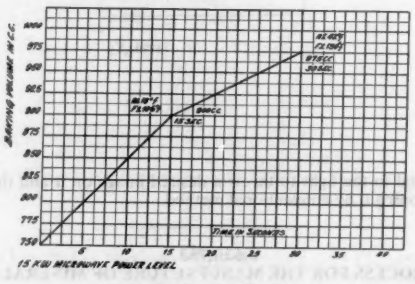
Batters suitable for distribution in a pressurized container under refrigerated conditions are provided by employing, as batter ingredients in specified amounts, flour, water, and edible humectant, a hydrophilic film former, and a chemical leavening composition which generates a sufficient amount of pressure to maintain an internal can pressure ranging from about 10 to about 20 p.s.i. Even after storage for several weeks, the batters are stable against microbial degradation while maintaining the batter product in a convenient ready-to-bake form. Stability of the batter against volume, grain and texture degradation is excellent.

3,620,764

METHOD OF CONTROLLING THE FUNCTIONAL CHARACTERISTICS OF FLOUR BY MICROWAVE TREATMENT OF GRAIN

Harley E. Watkins, Golden, Colo., assignor to Pet Incorporated, St. Louis, Mo.

Filed Aug. 26, 1968, Ser. No. 755,053The portion of the term of the patent subsequent to Jan. 26, 1988, has been disclaimed.
Int. Cl. A23l *1/10*
U.S. Cl. 99—93 6 Claims



A method of controlling the functional characteristics of flour produced from cereal grains by treating the grain prior to milling with microwave energy under controlled conditions of time, moisture, power, temperature and frequency.

3,620,765

METHOD AND APPARATUS FOR RIPENING FRUIT AND THE LIKE

Gerald F. McDonnell, Birmingham, Ala., and Hugh T. Freebairn, Houston, Tex., assignors to Banana Control, Inc., New Orleans, La.

Continuation-in-part of application Ser. No. 523,327, Jan. 27, 1966. This application Oct. 14, 1968, Ser. No. 767,426
Int. Cl. A23b *7/04*; A23l *1/00*
U.S. Cl. 99—103 9 Claims

A process for accelerating the ripening of unripe fruits in boxes, such as bananas, tomatoes, melons, pears, avocadoes, and the like, wherein the fruit is subjected to a timed ripening initiation step at temperatures of 68° to 95° F. in the presence of ethylene gas, and may then be subjected to subsequent stages of ripening and storage at selected temperatures. Improved uniformity of ripening may be made by subjecting unripe fruit to an initial high temperature whereby fruit previously uninitiated to ripening may be effected while simultaneously retarding ripening of fruit previously initiated to ripening.

3,620,766

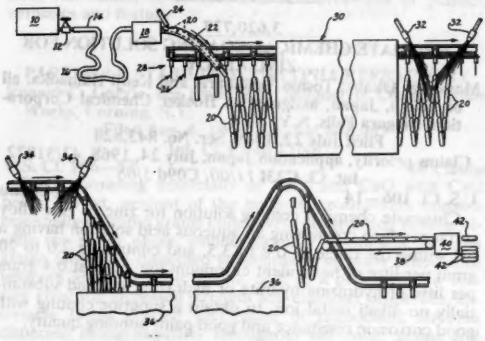
METHOD FOR PRODUCING SKINLESS WIENERS

Charles H. Wallace, Toledo, Ohio, assignor to Schmidt-Wallace, Inc., Toledo, Ohio

Continuation of application Ser. No. 657,423, July 31, 1967, now abandoned , Continuation of application Ser. No. 517,144, Dec. 3, 1965, now abandoned , Continuation-in-part of application Ser. No. 272,452, , now abandoned , Continuation-in-part of application Ser. No. 212,306, , now Patent No. 3,204,844. This application June 16, 1969, Ser. No. 837,995
Int. Cl. A22c *11/00*
U.S. Cl. 99—109 5 Claims

Skinless wieners are produced by treating them with an acid at a pH not more than 4 prior to cooking and subsequent processing. The acid can be sprayed over the wiener sections as they pass through a spray hood prior to entering

an oven, and is preferably edible. The acid treatment causes a skin to be formed on the wiener product under the artificial



casing which enhances the chewiness of the wiener and improves the peelability thereof.

3,620,767
BONITO PROCESSING
William E. Swartz, McKeesport, Pa., assignor to Calgon Corporation
Continuation-in-part of application Ser. No. 795,056, Jan. 29, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 617,474, Feb. 21, 1967, now abandoned. This application Dec. 8, 1969, Ser. No. 883,232
Int. Cl. A23l *1/325*
U.S. Cl. 99—111 9 Claims

Previously frozen bonito is treated prior to cooking with a molecularly dehydrated phosphate such as sodium tripolyphosphate or an orthophosphate so as to increase the yield of cooked bonito meat.

3,620,768
CHEESE MANUFACTURE
Edgar A. Corbin, Jr., Somerset, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio
Filed Apr. 8, 1969, Ser. No. 814,454
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 8 Claims

Cheese curd is manufactured by acidifying cold milk with free acid, heating to 80° F., adding acidogen and proteolytic enzyme, allowing cheese curd to form, cutting and cooking curd for about 1 hour. Cottage cheese can be produced in standard dairy equipment without using bacterial fermentation or other time consuming steps.

3,620,769
MARSHMALLOW COMPOSITION
Marvin A. Peterson, Park Ridge, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Continuation-in-part of application Ser. No. 716,317, Mar. 27, 1968. This application May 13, 1969, Ser. No. 824,263
Int. Cl. A23g *3/00*
U.S. Cl. 99—134 9 Claims

A humectant is added to a marshmallow composition containing a fat and polyglycerol higher fatty acid partial ester stabilizer in order to prevent migration of moisture from the marshmallow composition.

3,620,770
COATED STRAW FOR MODIFYING SOUR TASTE
Robert J. Harvey, Sudbury, Mass., assignor to Meditron, Inc., Wayland, Mass.
Filed Apr. 15, 1970, Ser. No. 28,963
Int. Cl. A23g *3/20*
U.S. Cl. 99—138 R 8 Claims

A coated straw useful for improving the taste of acidic liquids including carbonated beverages or fruit juices. The inside surface of the straw end inserted in the liquid is coated with a mixture of nontoxic alkaline material and sugar and a separate section of the inside surface is coated with taste-modifying stable miraculin. The amount of alkaline material is sufficient to render nonacid the liquid in the first mouthful.

3,620,771
1,4,5,6-TETRAHYDRO-2-ACETOPYRIDINE AND SALTS THEREOF AS FLAVORING AGENTS
Irving R. Hunter, Berkeley, and Mayo K. Walden, Cerrito, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture
Division of Ser. No. 717,399, Mar. 29, 1968
Filed Jan. 21, 1970, Ser. No. 8,113
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R 8 Claims

Proline and dihydroxyacetone are reacted in the presence of an alkali metal bisulphite to produce the new compound 1,4,5,6-tetrahydro-2-acetopyridine. This compound, as such, or in the form of its bisulphite complex or its salts, is useful for flavoring bread and other bakery products.

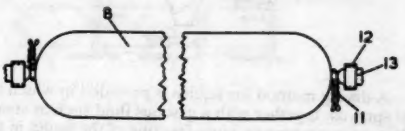
3,620,772
METHOD OF PRODUCING A MAILLARD REACTION PRODUCT HAVING MEATLIKE FLAVOR
Nagayoshi Kitada, Kanagawa-ken; Hideo Shimazaki, Kanagawa-ken, and Yasushi Komata, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Filed Mar. 25, 1969, Ser. No. 810,341
Claims priority, application Japan, Mar. 29, 1968, 43/20545
Int. Cl. A23l *1/22*
U.S. Cl. 99—140 R 5 Claims

When an aqueous solution of cystine or cysteine and of a reducing sugar is heated to 50°–120° C. at 70–200 kg./cm.², a Maillard reaction occurs at a rapid rate, and the reaction product obtained in 1 to 10 hours has a strong and pleasant meatlike flavor making it suitable as a seasoning for food.

3,620,773
METHOD FOR TREATING HARVESTED NONCHLOROPHYLLEOUS PRODUCE
Robert P. Gabriel, 20 Meadowview Road, Melrose, Mass.
Filed Apr. 3, 1969, Ser. No. 813,332
Int. Cl. A23b *7/00*; A61k *27/00*
U.S. Cl. 99—154 13 Claims

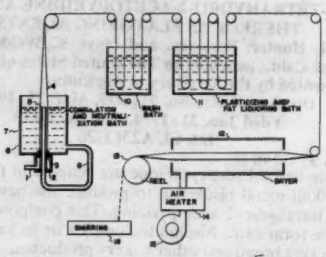
A method for controlling rot and decay in harvested nonchlorophylleous produce whereby the produce is sprayed or dipped into an aqueous solution containing an iodine releasing polymeric surfactant-iodine complex, a compatible surface active agent and sufficient acid to render the solution at least slightly acidic. This method is particularly adapted for treating vegetables and fruits including corn, cucurbits, bananas and potatoes.

3,620,774
PLASTICS CONTAINERS AND PACKAGES
Andrew George Ford, Hitchin, and Ronald Augustus Hudson, Welwyn Garden, both of England, assignors to Imperial Chemical Industries Limited, London, England
Filed Aug. 1, 1968, Ser. No. 749,497
Claims priority, application Great Britain, Aug. 1, 1967, 35,333/67 Aug. 1, 1967, 28354/68 Aug. 1, 1967, 28356/68 Aug. 31, 1967, 39820/67 Feb. 29, 1968, 9848/68 June 12, 1968, 27902/68 Aug. 1, 1968, 35337/67
Int. Cl. B65d *35/08*
U.S. Cl. 99—171 C 20 Claims



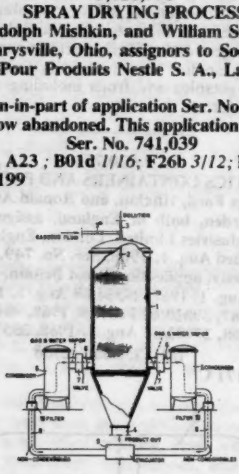
A plastics film container containing a gas under superatmospheric pressure, e.g. beer or a soft drink, closed by a ligature applied to the sealed, bunched neck below a thickened region thereof.

3,620,775
EDIBLE COLLAGEN CASING
Mauj A. Cohly, Catlin, Ill., and James W. Sanner, Midland, Mich., assignors to Tee-Pak, Inc., Chicago, Ill.
Filed Aug. 12, 1968, Ser. No. 752,077
Int. Cl. A22c *13/00*
U.S. Cl. 99—176 8 Claims



An edible sausage casing having improved stuffing, linking, and cooking characteristics is prepared from hide collagen. Animal hides, either fresh, frozen or salt-cured, limed or unlimed, are swollen and mechanically un-haired and split to produce a collagen-containing corium layer. The corium is ground into fine particles, formed into a slurry and swollen with weak acid to produce an extrudable collagen paste or slurry, preferably having a solids content of about 2–6 percent. The slurry is extruded through an annular die into a coagulation bath containing ammonium sulfate or sodium sulfate or equivalent coagulant and a small amount of strong alkali, such as sodium hydroxide, sufficient to neutralize completely the acid present in the slurry. The neutralization of the slurry may be partially in the coagulation bath and completed in a subsequent neutralization bath. The neutralization of the slurry hardens the coagulated collagen and avoids the necessity of tanning the extruded collagen casing. The neutralized casing is washed and finally plasticized using an aqueous solution of glycerin, or equivalent plasticizer, preferably containing a small amount of a fatty monoglyceride or an acetylated fatty monoglyceride. The casing is then dried and reeled and eventually shirred on a commercial shirring machine for delivery to the meat packer in shirred form.

3,620,776
SPRAY DRYING PROCESS
Abraham Rudolph Mishkin, and William Stephen Symbolik, both of Marysville, Ohio, assignors to Societe d'Assistance Technique Pour Produits Nestle S. A., Lausanne, Switzerland
Continuation-in-part of application Ser. No. 663,288, Aug. 25, 1965, now abandoned. This application June 28, 1968, Ser. No. 741,039
Int. Cl. A23 ; B01d *1/16*; F26b *3/12*; B01d *1/00*
U.S. Cl. 99—199 10 Claims



A drying method for liquids is provided in which the liquid is sprayed, together with a gaseous fluid such as steam, into a low-pressure zone to cause freezing of the liquid in small particle form, and the frozen particles are then freeze-dried. The liquid may be a bioliggical solution, fruit juice or tea or coffee extract. An apparatus is also provided, comprising a freezing chamber, a two fluid nozzle simultaneously spraying liquid and gas into the chamber, a vacuum system with condensers for maintaining a low pressure within the chamber and a freeze-drying chamber.

3,620,777
CHROMATE CHEMICAL COATING SOLUTION FOR ZINC ALLOY
Masanaga Okabe; Toshio Yoshihara, and Kenji Hamaoka, all of Tokyo, Japan, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.
Filed July 22, 1969, Ser. No. 843,828
Claims priority, application Japan, July 24, 1968, 43/51822
Int. Cl. C23f *11/00*; C09d *5/08*
U.S. Cl. 106—14 4 Claims

Chromate chemical coating solution for zinc or zinc alloy surfaces which comprising an aqueous acid solution having a pH within the range of 0.8 to 3.5, and containing 2.0 to 20 gram per litre of hexavalent chromium ion, at least 0.4 gram per litre of hydrazine hydrate or hydrazine salt and substantially no alkali metal ion, to obtain a superior coating with good corrosion resistance and good paint bonding quality.

3,620,778
METHOD OF MAKING DENTAL IMPRESSION AND DENTAL STONES HAVING SMOOTH SURFACES
Jacque C. Morrell, 8 Oxford St., Chevy Chase, Md.
Continuation of application Ser. No. 678,208, Oct. 26, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 494,971, Oct. 11, 1965, now abandoned. This application Sept. 17, 1969, Ser. No. 860,164
Int. Cl. C09k *3/00*
U.S. Cl. 106—35 12 Claims

Aqueous suspensions of polymeric organic substances of the class having elastomeric and plastic properties are added to conventional dental casting compositions containing calcium sulfate, an alginate dispersed in water and an inorganic filler for the purpose of producing nonchalky surfaces on dental impressions, casts, and models.

3,620,779
PHOSPHATE GLASS COATING FOR ELECTRICAL STEEL SHEETS
Karl Foster, and Joseph Seidel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Division of Ser. No. 576,693, Sept. 2, 1966, Pat. No. 3,528,863. Which is a Continuation-in-part of Ser. No. 556,337 June 9, 1966, abandoned
Filed June 15, 1970, Ser. No. 46,153
Int. Cl. C03c *3/02, 5/02, 7/02*
U.S. Cl. 106—47 R 3 Claims

A glass having a thermal coefficient of expansion of less than 8.5×10^{-7}° C. for coating steel sheets to place the steel sheets in tension, comprising, by weight, from 60 to 70 percent of P_2O_5 from 10 to 14 percent of MnO, from 9 to 12 percent of Al_2O_3 and at least 5 percent of other compatible oxides.

3,620,780
BORON NITRIDE FIBER MANUFACTURE
James Economy, Eggertsville, and Raymond V. Anderson, Ransomville, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.
Continuation-in-part of application Ser. No. 471,208, July 12, 1965, now Patent No. 3,429,722. This application Nov. 18, 1968, Ser. No. 776,562
Int. Cl. C04b *35/58, 35/14*
U.S. Cl. 106—55 4 Claims

Fibers incorporating a boron and nitrogen containing composition are produced by reacting, with a nitrogen and hydrogen containing composition, fibers having a maximum diameter of about 20–30 microns and incorporating substantially throughout their thickness a boron and oxygen containing composition. Preferably, boric oxide fibers having a maximum diameter of about 10 microns are heated in an ammonia atmosphere according to a suitable temperature program to produce fibers consisting essentially of a boron

nitride composition. Fibers may also be produced consisting of boron nitride and other constituents such as silica. Fibers produced according to the invention are useful for a wide variety of purposes including thermal and electrical insulation, fabrication of textiles and reinforcement of plastics, ceramics and metals.

3,620,781

PARTIALLY STABILIZED ZIRCONIA REFRACTORY

Ronald C. Garvie, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 6, 1969, Ser. No. 848,087
Int. Cl. C04b *35/48*
U.S. Cl. 106—57 **10 Claims**

Body consisting essentially of ZrO_2 and CaO with CaO being 2–5 wt. percent of the body. Microstructure consists essentially of cubic grains collectively constituting volumetrically the major phase, smaller primary monoclinic zirconia grains randomly dispersed substantially at grain boundaries between adjacent cubic grains, and, as a principal new feature effecting increased strength and elasticity properties, extremely finely divided precipitate of monoclinic zirconia dispersed intragrangularly throughout the cubic grains and being substantially smaller than the primary monoclinic zirconia grains. Cubic grains composed essentially of a solid solution of ZrO_2 in a compound $CaZr_4O_9$.

Manufacturing process comprises preparing batch material of prescribed composition, heating the material at firing temperature of at least 1,800° C. that causes sintering or melting of the material, cooling fired material to an annealing temperature of 900°–1,700° C. and maintaining it at the annealing temperature for at least about one day and thereafter continuing cooling of the material. Product is either sintered or fusion-cast body. Batch material can be either unfused or fused finely divided particles. Unfused batch can be either unreacted or prereacted raw materials. For optimum density from unreacted raw material batch, it is heated, prior to molding, to prefiring temperature of 900°–1,300° C. for at least about one day. CaO can be provided in batch by heat decomposable compound whose solid decomposition product is substantially all CaO, e.g. calcium acetate monohydrate.

3,620,782

MANUFACTURE OF FUSED CAST BASIC REFRACTORY

Robert N. McNally, Corning, N.Y., and Robert F. Patrick, Louisville, Ky., assignors to Corhart Refractories Company, Louisville, Ky.

Continuation-in-part of 655,273, July 24, 1967, now abandoned. This application Mar. 3, 1970, Ser. No. 16,252
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 **8 Claims**

Method for preventing or ikhibiting hydration cracking or disintegration of fused cast basic refractory made from a mixture consisting essentially of magnesia and chrome ore, which has an oxide analysis, by weight, or at least 40% MgO, at least 12% Cr_2O_3, at least 5% Al_2O_3, at least 3% FeO, up to 3% CaO, up to 5% SiO_2, up to 10% TiO_2, up 3% fluorine, and in which the total of $MgO + Cr_2O_3 + Al_2O_3 + FeO$ is at least 82%, wherein 0.5 to 5 wt. percent (based on the total weight of the basic refractory ingredients) of at least one oxygen-containing compound of sodium and/or potassium is added to and mixed with the basic refractory batch materials. The compound can be a carbonate, phosphate, silicate and/or sulfate. Batch materials are then melted and cast into preformed molds in the usual manner to form solidified monolithic fused cast articles or bodies.

3,620,783

SILICA REFRACTORY MATERIAL

Ernst Mahler, Wiesbaden-Bierstadt; Erich Becker, Oberdollendorf; Hansulrich Czapla, Romlinghoven; Fritz Klasse, Winkel, Rhine, and Ulrich Ehrcke, Wiesbaden, all of Germany, assignors to Didier-Werke A.G., Wiesbaden, Germany

Filed Apr. 18, 1968, Ser. No. 722,177
Claims priority, application Great Britain, June 3, 1967, 25,733/67
Int. Cl. C04b *35/14*
U.S. Cl. 106—69 **7 Claims**

A silica refractory material, void of heavy metal oxides, contains over 95% of SiO_2 and not more than 3% CaO both by weight. Its bulk density is over 1.90 gr. per cc., and its total porosity is under 20 percent (preferably 18.5 to 19 percent). Its thermal conductivity is over 2.0 cal. per m.hr. ° C. at a test temperature of 1,200° C. It is produced by mixing the SiO_2 (preferably quartzite) with CaO in any suitable form (and preferably lime) in the required proportions, subjecting the mass to a compressure pressure which increases, throughout an increase period of more than 10 seconds, to at least 700 kg. per sq. cm., whereby air is excluded, and firing the compressed mixture at a temperature which increases slowly from 1,300° to 1,500° C. and holding that maximum temperature for not less than 35 hours.

The material is characterized by high-thermal conductivity, high-bulk density, low porosity, and marked dimensional stability at high temperatures. It is suitable for refractory bricks, particularly for use in lining the chambers of coke ovens.

3,620,784

POTASSIUM SILICATE-ZINC COATINGS

John B. Schutt, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 24, 1968, Ser. No. 700,040
Int. Cl. C09d *1/02, 1/04*
U.S. Cl. 106—84 **2 Claims**

A zinc dust formulation for steel and the like utilizing as a vehicle a potassium silicate solution having a SiO_2/K_2O ratio of about 4.8 to 5.3, said composition being resistant to abrasion and not subject to cracking and crazing during drying and preferably containing methyltrimethoxysilane to enhance these properties.

3,620,785

ALUM CONTAINING ALUMINOUS CEMENTS

Roland L. Root, Tulsa, and Louis H. Eilers, Inola, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 20, 1970, Ser. No. 42,758
Int. Cl. C04b *7/32*
U.S. Cl. 106—104 **5 Claims**

An hydraulic cement composition comprising an aluminous cement and an alum and method of cementing comprising admixing said composition with water and emplacing it in a geologic formation via a well penetrating the formation.

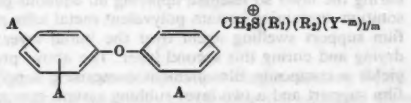
3,620,786

STARCH AND CELLULOSIC PRODUCTS TREATED WITH WATER-SOLUBLE SULFONIUM DERIVATIVES OF DIPHENYL ETHER

Melvin J. Hatch, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 553,046, May 26, 1966, Pat. No. 3,502,710 which is a Continuation-in-part of Ser. No. 322,057, Nov. 7, 1963, abandoned
Filed Aug. 27, 1969, Ser. No. 870,844
Int. Cl. C09j *3/06*
U.S. Cl. 106—213 **5 Claims**

Starch films and cellulosic coatings of improved water-resistance are prepared by incorporating a water-soluble sulfonium derivative of diphenyl ether of Formula I:



where each A is $-H$ or $-CH_2\overset{\oplus}{S}R_1R_2(Y^{-m})_{1/m}$ and Y is an anion having a valence m of 1, 2 or 3, in the aqueous film or coating solution and thereafter heating the solution to form a dry film or coating.

3,620,787

GLASS COMPOSITION

Robert M. McMarlin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Oct. 2, 1968, Ser. No. 764,617
Int. Cl. C03c *3/04, 13/00;* B32b *17/06*
U.S. Cl. 106—287 S 21 Claims

A glass composition comprising silica, alumina, beryllia, and magnesia and fibers formed therefrom on conventional production equipment, exhibit improved modulus, tensile strength, high-temperature resistance and lower density over formerly available textile filaments, and show particular utility in reinforcement of plastic laminates where high strength-to-weight ratios are desired and imperative.

3,620,788

SPARINGLY SOLUBLE ORGANIC DYESTUFFS

Willy Mueller, Riehen, and Felix Steinlin, Reinach Basel-Land, both of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed Oct. 28, 1968, Ser. No. 771,355
Claims priority, application Switzerland, Nov. 10, 1967, 1547/67; Sept. 20, 1968, 14079/68
Int. Cl. C09c
U.S. Cl. 106—288 O 11 Claims

Spin-dyeing of viscose with solutions of organic pigments containing sulfonamido or phenyl sulfonamido groups.

3,620,789

SURFACE MODIFIED CLAYS AND METHODS OF MAKING THE SAME

David H. Solomon, Summit, N.J., assignor to Georgia Kaolin Company

Filed Apr. 10, 1969, Ser. No. 814,925
Int. Cl. C09c *1/28*
U.S. Cl. 106—288 B 8 Claims

A surface modified kaolin and method for producing the same is provided in which a kaolin is dried and then mixed with an amine in a relatively anhydrous organic diluent to provide an amine modified clay independent of exchange capacity of the clay.

3,620,790

A SUBBING SOLUTION COMPRISING POLYVALENT METAL CHLORIDE SALTS AND A SWELLING AGENT

Walter R. White, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 696,088, Jan. 4, 1968, Pat. No. 3,535,147
Filed Sept. 30, 1969, Ser. No. 862,182
Int. Cl. C09k *1/06*
U.S. Cl. 106—287 5 Claims

A direct aqeuous sub assures adhesion of polymeric layers to a variety of polymer film supports for exceptionally long periods under extreme variations of environmental conditions. The invention relates to a two-component subbing system which comprises a first aqueous subbing solution containing a swelling agent for the polymer film being subbed and certain polyvalent metal salts and a second aqueous subbing colution containing a gelatin, a swelling agent for polymer film being subbed akd certain polyvalent metal salts. According to the present processes, subbing of the polymer film support is achieved by applying a dilute aqueous solution of certain polyvalent metal salts plus a polymer film support swelling agent to the polymer film support; drying and curing the layer so formed; applying an aqueous-gelatin solution containing certain polyvalent metal salts plus a film support swelling agent over the initial layer; and drying and curing this second layer. The above process yields a composite film element comprising a polymer film support and a two-layer subbing system comprising a first thin layer of certain polyvalent metal salts adhering tightly to the polymer film support and a second thin layer of a gelatin and certain polyvalent metal salts lying over said first layer and adhering thereto. This application is directed to the aqueous first subbing compositions that are applied initially to the film support.

3,620,791

INORGANIC THERMAL CONTROL COATINGS

Albert C. Krupnick, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 3, 1969, Ser. No. 813,338
Int. Cl. C08h *17/02*
U.S. Cl. 106—288 B 7 Claims

Inorganic coating compositions are based on a binder obtained by gelling a suspension of synthetic mica or sodium magnesium fluorolithosilicate mineral with a solution of a soluble metal silicate or sulfate. Pigments and other additives are included to provide the desired optical properties. For solar reflector coatings zinc oxide pigment and hollow glass microspheres are employed.

3,620,792

PROCESS FOR TREATING CARBON BLACK

Erivan Hagopian, Lexington, Mass., assignor to Cabat Corporation, Boston, Mass.

Filed Mar. 26, 1969, Ser. No. 810,811
Int. Cl. C09c *1/44*
U.S. Cl. 106—307 10 Claims

This disclosure relates to the use of an oxide of nitrogen in combination with ozone as an additive in an aftertreatment process for preparing modified carbon blacks and to the novel carbon black products produced thereby.

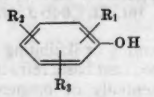
3,620,793

PIGMENT PREPARATIONS TO BE USED IN NONAQUEOUS SYSTEMS

Hartmut Gossel, Kriftel, Taunus; Kurt Merkle, Kelkheim, Taunus; Ferdinand Memmel, Frankfurt, Main, and Erwin Janousch, Camberg, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Aug. 30, 1968, Ser. No. 756,388
Claims priority, application Germany, Sept. 4, 1967, P 16 69 157.9
Int. Cl. C09c *3/02*
U.S. Cl. 106—308 Q 4 Claims

Pigment dispersions consisting of a finely distributed pigment dyestuff in a dispersing medium suitable for being used in nonaqueous systems, wherein the dispersing medium consists of compounds of the general formula



wherein R_1 represents an alkyl radical with four to 18 carbon atoms, and R_2 and R_3 are hydrogen atoms or alkyl groups containing from one to 18 carbon atoms, the alkyl groups being straight-chained or branched, or a mixture thereof, and a process for their manufacture.

3,620,794

METHOD OF FORMING A PATTERNED RADIATION SOURCE

Carlos G. Figueroa, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed June 30, 1967, Ser. No. 650,226
Int. Cl. G21h *1/00*
U.S. Cl. 117—5.5 10 Claims

Precisely patterned radiation sources are formed by exposing a base member to an inert gas radioisotope (krypton–85) at an elevated temperature and pressure to cause interstitial penetration of the atoms of the radioisotope into the lattice of the base material as controlled by a pattern formed on the surface of the base. Another procedure involved uniformly diffusing the atoms of the inert gas radioisotope into the lattice of a base material and subsequently etching portions of the surface to provide a precisely patterned radiation source.

3,620,795

TRANSPARENT MASK AND METHOD FOR MAKING THE SAME

William M. Kiba, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Apr. 29, 1968, Ser. No. 724,903
Int. Cl. B44d *1/52*
U.S. Cl. 117—5.5 8 Claims

Transparent glass mask having a copper stain formed therein, the outer perimeters of which have a depth greater than the inner portion of the stain and a method for making the same in which a pattern of aluminum is formed on the glass and serves as a mask for driving the copper into the glass.

3,620,796

SUBSTRATES HAVING STRIPPABLE PROTECTIVE COATINGS

Travis L. Gordy, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 13, 1969, Ser. No. 791,541
Int. Cl. B65b *33/00;* B44d *1/34*
U.S. Cl. 117—6 15 Claims

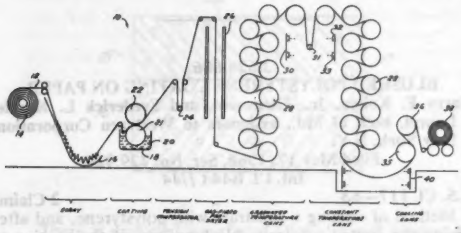
This disclosure concerns an article of manufacture comprising a substrate e.g. automobile molding) having a readily strippable protective coating of a composition comprising petroleum wax and an ethylene-vinyl acetate copolymer containing from 16 to 22 percent vinyl acetate. In some instances an ethylene-isobutyl acrylate copolymer may be substituted for a portion of the ethylene-vinyl acetate copolymer.

3,620,797

IMPREGNATION OF A NONWOVEN FABRIC

Robert D. Feitlowitz, Ridgewood, N.J., assignor to DHJ Industries Inc., New York, N.Y.

Filed Jan. 14, 1969, Ser. No. 791,071
Int. Cl. B44d *1/46;* C09r *3/28;* B32b *27/12*
U.S. Cl. 117—7 2 Claims



A coating composition which imparts certain desired properties, such as opacity, water repellency, and fire resistance, to a nonwoven fabric comprising randomly arranged continuous filament polymeric fibers. The ingredients of the coating not only impart the desired properties but also are compatible with one another. The coating is applied on an apparatus wherein the tension and the temperature of the fabric are controlled to prevent elongation thereof.

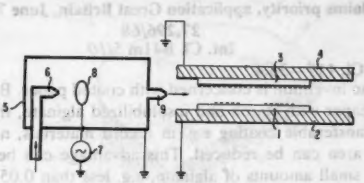
3,620,798

DEVELOPMENT OF LATENT ELECTROSTATIC IMAGE EMPLOYING NOVEL DEVELOPMENT ELECTRODE

Satoru Honjo; Yasuo Tamai; Masamichi Sato, and Seiji Matsumoto, all of Saitama, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Ashigara-Kamigum, Kanagawa, Japan

Filed Jan. 16, 1968, Ser. No. 698,229
Claims priority, application Japan, Jan. 18, 1967, 42/3496
Int. Cl. G03g *13/00;* B05c *5/02*
U.S. Cl. 117—17.5 4 Claims

A process of developing a latent electrostatic image, which comprises facing across a small clearance an insulator having a latent electrostatic image and another insulator for electric field regulating, having the same polaity as said insulator, uniform charges and characteristics substantially similar to the dark attenuation characteristics of said insulator under



the developing condition, and feeding developing particles having the same polairity as that of said latent electrostatic image to the clearance, whereby to develop said latent electrostatic image.

3,620,799

METHOD FOR METALLIZING A CERAMIC BODY

Max W. Hoelscher, Lancaster, and Paul D. Strubhar, Pequea, both of Pa., assignors to RCA Corporation

Filed Dec. 26, 1968, Ser. No. 787,200
Int. Cl. C04b *41/14;* C23c *17/00*
U.S. Cl. 117—22 10 Claims

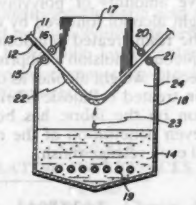
A method for metallizing a ceramic body comprising coating a surface of the ceramic body with a metallizing composition consisting essentially of 10 to 90 weight parts uncoated molybdenum or tungsten metal particles, 4 to 80 weight parts molybdenum or tungsten metal particles which have an adherent coating of nickel, iron, and/or cobalt metal, and 2 to 27 weight parts ceramic sinter powder. The coated ceramic body is then heated in the range of about 1,100° to 1,500° C. in a reducing atmosphere to produce a sintered metal coating on the ceramic body. Then, the metal coating on the ceramic body may be brazed or soldered to a metal body or to another metallized body.

3,620,800

CLEANING LIQUID DEVELOPED ELECTROSTATIC IMAGES BY CONTACT WITH VAPORIZED CLEANING FLUID

Yasuo Tamai, and Satoru Honjo, both of Asaka-shi, Saitama, Japan, assignors to Xerox Corporation, Rochester, N.Y.

Filed Mar. 14, 1969, Ser. No. 807,193
Int. Cl. G03g *13/10;* B08b *3/04*
U.S. Cl. 117—37 LE 8 Claims



Images are improved by evaporating a cleaning liquid in a cleaning liquid reservoir, condensing the resulting cleaning liquid vapor, following the condensed cleaning liquid over the surface of a developed electrostatographic recording member to remove toner particles from the background areas as well as other contaminants and returning the spent liquid to the cleaning liquid reservoir.

3,620,801
SIZED TRANSFER SHEET
Michael Hugh O'Grady, Wick, Wales, assignor to Wiggins Teape Research & Development Limited, London, England
Filed June 6, 1969, Ser. No. 831,236
Claims priority, application Great Britain, June 7, 1968, 27,296/68
Int. Cl. B41m 5/10
U.S. Cl. 117—36.4 7 Claims

The invention is concerned with coated paper. By precoating paper with starch and insolubilized alginate, the amount of transferable coating e.g. in record materials, needed per unit area can be reduced. This advantage can be achieved with small amounts of alginate, e.g. less than 0.05 gram per square meter per side, and high starch to alginate weight ratios e.g. 85:1.

3,620,802
DUPLICATING RIBBONS AND PROCESS
Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon & Carbon Mfg. Co., Inc., Glen Cove, N.Y.
Continuation-in-part of application Ser. No. 654,857, July 20, 1967, now abandoned. This application Dec. 8, 1969, Ser. No. 882,817
Int. Cl. B41m 5/10
U.S. Cl. 117—36.4 10 Claims

Process for producing novel fabric duplicating ribbons having improved ink-receptivity formed from synthetic thermoplastic filaments, in which the ribbons are rendered more ink-receptive by contact at elevated temperatures with vapor of a compound of titanium, silicon or germanium in the presence of moisture, and are thereafter impregnated with ink.

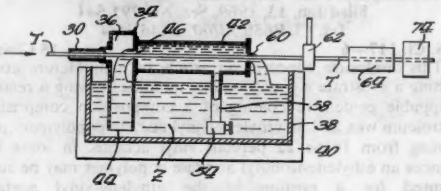
3,620,803
SELVAGE FINISH COMPOSITIONS AND THE TREATMENT OF RESIN TREATED CELLULOSIC FABRICS THEREWITH
Robert O. Lineberger, Stanley; James S. Wiberley, Gastonia, and Joseph R. Griffin, Hamilton, all of N.C., assignors to Beaunit Corporation, New York, N.Y.
Filed June 24, 1969, Ser. No. 836,141
Int. Cl. D06c 25/00; D03d 47/50
U.S. Cl. 117—44 9 Claims

Resin treated cellulosic fabrics having a firm and even selvage finish are prepared by treating the selvage of the resin treated cellulosic fabric with an aqueous emulsion comprising effective amounts of polyvinyl acetate and a low molecular weight alcohol followed by drying of the aqueous emulsion on the resin treated cellulosic fabric. The application of the aqueous emulsion comprising polyvinyl acetate and a low molecular weight alcohol as described above to the selvage of resin treated cellulosic fabrics followed by drying of the emulsion on the fabric has been found to provide uniform and even penetration of the resin treated fabric to give a firm and even selvage finish.

3,620,804
METAL PLATING OF THERMOPLASTICS
Randy L. Bauer, Marietta, Ohio; David C. Johnson, Washington, W. Va., and Ronald M. Noss, Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Jan. 22, 1969, Ser. No. 793,193
Int. Cl. B44d 1/092; C23c 3/02
U.S. Cl. 117—47 A 7 Claims

A method of electrolessly plating a thermoplastic substrate with a metal, such as copper, nickel or cobalt, prior to application of an electrolytically deposited metal. A novel surface treatment step which includes an improved neutralizer for the conventional chrome-containing chemical etch, is effective in promoting electroless metal coverage and the adhesion between the electroless metal layer and the substrate.

3,620,805
METHOD FOR THE CONTINUOUS HOT GALVANIZING OF CONTINUOUSLY FORMED ELEMENTS
Carl Martin, Lisle, Ill., assignor to Mrs. Kay M. Ray, Chicago, Ill., a part interest
Filed Mar. 17, 1969, Ser. No. 807,673
Int. Cl. C23c 1/02
U.S. Cl. 117—51 5 Claims



Method and apparatus for the continuous hot galvanizing of tubing wherein the molten zinc in the zinc furnace and zinc vat are continuously exposed to the atmosphere, and one end of a zinc tube is maintained under a nonoxidizing atmosphere in sealed communication with tubing heating means. The tubing is heated to at least about 1,100° F. prior to entry into the zinc tube.

3,620,806
BLUSHED POLYSTYRENE COATING ON PAPER
Harry F. Kohne, Jr., Glenwood, and Frederick L. Kurrle, Laurel, both of Md., assignors to Westvaco Corporation, New York, N.Y.
Filed May 17, 1968, Ser. No. 729,920
Int. Cl. B44d 1/44
U.S. Cl. 117—63 2 Claims

Method of coating a substrate with polystyrene, and after drying the coated substrate, blushing part of the coating to produce either a very glossy or a mat finish on the coated surface, leaving unblushed polystyrene separating the blushed portion of the polystyrene and the substrate. Coated products, suitable for printing, are produced and comprise a substrate bearing on at least one surface a coating of polystyrene, the surface of the coating being microporous and opaque, the substrate and blushed portion of the coating being bridged by unblushed polystyrene.

3,620,807
TEXTILE SOFTENER COMPOSITION
Leo Thomas Murray, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 29, 1967, Ser. No. 686,756
Int. Cl. D06m 13/46
U.S. Cl. 117—66 5 Claims

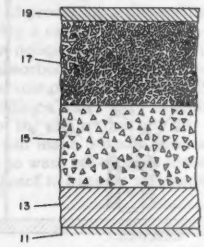
This disclosure relates to a method and composition for imparting softness to textiles without yellowing by utilizing a borohydride-containing composition either in the form of a fabric-softening quaternary ammonium salt and an alkali metal borohydride or the corresponding qutarnary borohydride.

3,620,808

METHOD OF FORMING A THERMAL EMISSIVITY COATING ON A METALLIC SUBSTRATE

James E. Monroe, Jr., Timonium, Md.

Filed Jan. 5, 1968, Ser. No. 697,281
Int. Cl. C23c 7/00
U.S. Cl. 117—69 2 Claims



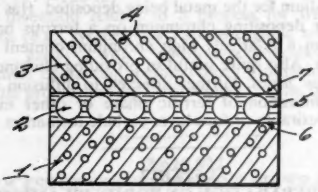
A method for coating metallic substrates with high thermal emissivity coatings to prevent failure of the thermal emissivity coatings due to handling and thermal shock by applying an intermediate or base coat of nickel aluminide.

3,620,809

DIFFUSION COATING

Howard D. Flicker, North Miami, Fla., assignor to API Corporation, Miami, Fla.

Continuation-in-part of application Ser. No. 635,476, May 2, 1967, now Patent No. 3,535,146. This application June 5, 1970, Ser. No. 43,914
Int. Cl. B44d 1/16
U.S. Cl. 117—71 M 6 Claims



There is provided a surfaced alloyed metal product and a method for production thereof. The metal part to be surface alloyed is coated with a decomposable compound, coated with an alloying material, and heated to an elevated temperature above the decomposition temperature of the decomposable compound in a dry gaseous atmosphere, especially in a hydrogen atmosphere. The decomposable compound must contain at least one element which has an atomic volume greater than the atomic volumes of the elements of the metal part to be surface alloyed and the alloying materials. Preferably the decomposable compound contains an element which has an atomic volume at least 1.1 times the atomic volumes of the metal part and alloying material.

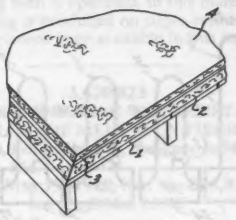
3,620,810

COATED ROOF SURFACE

Raymond L. Carter, Jr., 1346 No. Eastbury Ave., Covina, Calif.

Filed Oct. 23, 1968, Ser. No. 769,847
Int. Cl. B44d 1/14; E04d 1/02
U.S. Cl. 117—72 1 Claim

A method of resurfacing a roof and the coated roof are disclosed in which a roof surface is coated in sequence with a subbase coating comprising mineral wool insulation, perlite, clay, gypsum and aluminum sulfate, a waterproof coating additionally containing asphalt, and a top coating additionally containing polyvinyl acetate and titanium dioxide.



3,620,811

SUPPLE POROMERIC LAMINATE

Richard T. Morrissey, Cuyahoga Falls, and Nelson C. Hess, Akron, both of Ohio, assignors to The B.F. Goodrich Company, New York, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,601
Int. Cl. B44d 1/14; D06n 3/08
U.S. Cl. 117—76 T 3 Claims

Previous poromeric laminates comprise a nonwoven substrate impregnated with from 50 percent to 200 percent by weight of fiber of a synthetic polymer, a textile sheeting interlayer, and a top film of an essentially linear polyurethane adhered thereto. Marked improvement in the softness, suppleness and drapeability of the material are found when the impregnant polymer is not placed entirely as an impregnant or saturant in the substrate mass, but is instead mainly spread and cured as a coating layer thereon and the essentially linear polyurethane film is then formed on the cured polymer film with no textile sheeting layer being employed.

3,620,812

FILM MATERIAL FOR LITHOGRAPHIC PLATES

David Leonard Boutle; Margaret Loudon Clachan, and David Rankine Kennedy, all of Manningtree, England, assignors to Bexford Limited, Manningtree, Essex, England

Filed Aug. 9, 1968, Ser. No. 751,372
Claims priority, application Great Britain, Aug. 24, 1967, 39,112/67
Int. Cl. B41m 1/18; G03c 1/78
U.S. Cl. 117—76 11 Claims

A film material for use in production of a lithographic printing plate comprises a polyester film material which has been pretreated with a halogen-containing phenolic substance or chloro-substituted aliphatic acid and treated at 30° C. or above, coated with a polymer interlayer and overcoated with an insoluble hydrophilic layer containing a filler. The outer layer of the product may carry a positive or negative-working light-sensitive layer.

3,620,813

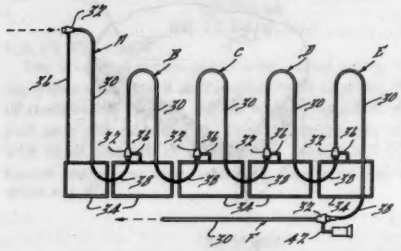
METHOD OF TREATING WORKPIECES IN A TREATING FLUID

Louis J. Minbiole, Jr., Detroit; Chester G. Clark, Grosse Pointe Woods, and John W. Neumann, Birmingham, all of Mich., assignors to The Udylite Corporation

Filed Nov. 12, 1968, Ser. No. 774,761
Int. Cl. B05b 3/04, 3/02
U.S. Cl. 117—94 22 Claims

An apparatus and method for simultaneously treating and conveying containerlike workpieces in which the workpieces are introduced and entrained in aligned orientation in a confined stream of a selected treating fluid and are subsequently

extracted therefrom and whereafter, if desired, the workpieces are successively introduced into separate succeeding



confined streams of alternative selected treating fluids to effect a multiple stage treatment thereof.

3,620,814

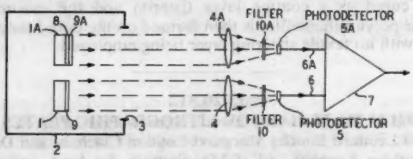
CONTINUOUS MEASUREMENT OF THE THICKNESS OF HOT THIN FILMS

Conrad A. Clark, Bethlehem; Austin C. Dumbri, Easton, and James F. Roberts, Bethlehem, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 9, 1968, Ser. No. 751,597

Int. Cl. C23c *11/00*

U.S. Cl. 117—106 R **4 Claims**



Described herein is a method for monitoring the thickness of a thin transparent film while it is growing on a hot substrate by vapor deposition.

In a specific example, two silicon substrates, of which one has a predeposited coating of silicon dioxide, are located close together to be subjected to a similar vapor deposition of alumina films. The difference in electromagnetic radiation emitted by each substrate and transmitted through each film is monitored, and the deposition process is terminated just after this difference reaches a prescribed value.

3,620,815

VAPOR COLLIMATION IN VACUUM DEPOSITION OF COATINGS

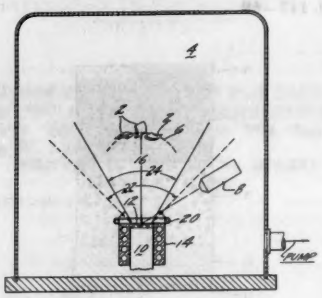
Sol S. Blecherman, Newington; Mitchell J. Bala, Hazardville; Dennis J. Evans, Rocky Hill, and Nicholas E. Ulion, Vernon, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 13, 1969, Ser. No. 806,955

Int. Cl. C23c *11/00, 13/00*

U.S. Cl. 117—106 R **6 Claims**

In the processes for forming protective coatings on metals, particularly the nickel-base and cobalt-base superalloys, by deposition in vacuum, an inert gas cascade surrounding the



melt is utilized to collimate the coating vapor cloud and reduce low angle deposition.

3,620,816

METHOD OF DIFFUSION COATING METAL SUBSTRATES USING MOLTEN LEAD AS TRANSPORT MEDIUM

John J. Rausch, Route 2 Box 177, Antioch, Ill., and Ray J. Van Thyne, 10148 S. Coah Ave., Oak Lawn, Ill.

Filed Oct. 16, 1968, Ser. No. 768,187

Int. Cl. C23c *1/00, 1/06*

U.S. Cl. 117—114 **8 Claims**

A method of diffusing a metallic coating into a metallic substrate using molten lead, in some embodiments, as the transport medium for the metal being deposited. Has particular utility for depositing chromium on a ferrous base substrate to form a relatively high chromium content surface layer thereon. Also quite useful in providing aluminum containing surface zones. Further directed to diffusion alloying with the stabilization of ferritic phase or other means of reducing undesirable surface layer carbide formation.

3,620,817

SURFACE PREPARATION ON BORON FILAMENTS FOR ADHESIVE APPLICATIONS

Vincent D. Celentano, Malvern, Pa., assignor to General Electric Company

Filed Jan. 3, 1969, Ser. No. 788,942

Int. Cl. B44d *1/02, 1/092*

U.S. Cl. 117—118 **8 Claims**

The surface of boron filaments is chemically treated with a polyfunctional organic coupling agent, such as p-xylylene chloride or diglycidyl ether of bis-phenol A, at an appropriate temperature, to enhance its wettability and adhesion to a resinous matrix material.

3,620,818

METHOD OF IMPARTING FLAME RESISTANT PROPERTIES TO NYLON AND THE TREATED PRODUCT

Roland J. Bryan, Jr., Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 9, 1968, Ser. No. 766,285

Int. Cl. B32b *27/34*

U.S. Cl. 117—118 **6 Claims**

Nylons are rendered resistant to a self-sustaining flame by treating the surface thereof with certain methylol compounds.

3,620,819

METHOD OF PRODUCING A DIRT-RESISTANT TILE

Michele Croce, 740 Northeast 26th Ave., Pompano Beach, Fla.

Division of Ser. No. 706,697, Feb. 19, 1968, abandoned
Filed Feb. 26, 1970, Ser. No. 14,640
Int. Cl. C04b 21/00
U.S. Cl. 117—123 A 5 Claims

A method of producing a dirt-resistant cement tile and the like, preferably a cement roofing tile, in which a solution of one or more deliquescent salts, such as, for example, zinc chloride, is absorbed and adsorbed into the surface thereof to create a reservoir of the solution within the tile ad the like, thereby providing a water wetness ambient of permanence on the surface of the tile, so that any dirt deposited on the water wet surface will make a weak bond and thereby permit the normal rains to wash off the dirt accumulated on the tile surface, and the roof to become self washing.

3,620,820

ANTIWETTING METHODS AND COMPOSITIONS

Patrick Henry Hess, Diamond Bar, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 1, 1966, Ser. No. 569,036
Int. Cl. C03c 17/30
U.S. Cl. 117—124 6 Claims

Hydroxylic surfaces are rendered resistant to wetting and fogging for long periods of time by the application to such surfaces of a minor amount of a lower trialkoxy compound of silicone.

3,620,821

TREATMENT OF FIBERS WITH SILOXANE-POLYOXYALKYLENE BLOCK COPOLYMERS CONTAINING METHOXYSILOXY GROUPS

Gordon C. Johnson, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 18, 1968, Ser. No. 760,735
Int. Cl. C03c 25/02; C08g 47/10
U.S. Cl. 117—126 GS 13 Claims

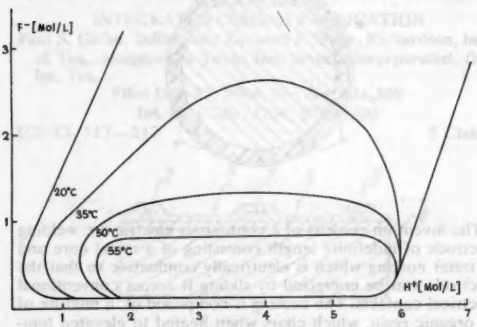
This invention relates to a process for treating fibrous materials (e.g., synthetic or natural organic textile fibers or fibrous glass) with siloxane-polyoxyalkylene block copolymers containing methoxysiloxy groups in order to improve the properties (e.g., soil release) of the fibrous materials.

3,620,822

PROCESS OF COPPER PLATING SUPER-REFINED STEEL

Han Yong Oei, and Siegfried Moller, both of Frankport, Main, Germany, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 22, 1968, Ser. No. 778,117
Int. Cl. C23c 3/00
U.S. Cl. 117—130 R 5 Claims



A process for the currentless copper plating of super refined steel wherein the steel is contacted with a solution containing copper, hydrogen and fluoride ions, but no inhibitors, to produce, through cementation, a copper coating on the steel. The concentration of the fluoride ions and hydrogen ions in the plating solution are maintained within specified, varying ranges, depending upon the temperature at which the coating bath is operated. In this manner, a currentless copper coating is produced on super-refined steel, which steel has not heretofore been coatable in this manner.

3,620,823

PROCESS OF IMPROVING THE RESISTANCE OF SOILING OF MELT SPUN FIBERS

Andrew L. Smith, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed May 19, 1969, Ser. No. 826,018
Int. Cl. D06m 15/66
U.S. Cl. 117—138.8 R 3 Claims

Polyamide and polyester fibers are rendered highly resistant to soiling by applying to the fibers during the manufacture thereof a finish comprised of a water-soluble lubricating agent, a silicone, and a tin or zirconium compound, and subsequently scouring the fibers to remove substantially all of the lubricating agent while a major portion of the silicone and metal compounds remains adhered to the fiber.

3,620,824

WHITE THERMALLY STABLE POLYETHER MODIFIED POLYESTER FIBERS AND METHOD OF PRODUCTION

Philip E. Slade, Pensacola, Fla.; Robert T. Estes, Cary, and James C. Randall, Durham, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed June 3, 1968, Ser. No. 733,831
Int. Cl. B44d 1/46; B32b 27/36
U.S. Cl. 117—138.8 F 6 Claims

The thermal stability in the presence of oxygen of polyether-modified polyethylene terephthalate fibers in increased by applying thereto at least about 150 parts per million based on the weight of the fiber of a mixture consisting essentially of

1. from about 65 to 85 percent based on the weight of the mixture of a hindered bis-phenol selected from the group consisting of 4, 4'-butylidenebis (6-t-butyl-m-cresol) and 2, 2'-butylidenebis (6-t-butyl-m-cresol), and
2. from about 35 to 15 percent based on the weight of the mixture of a polymer of 2,2, 4-trimethyldihydroquinoline having a number average molecular weight of from about 450 to 700.

3,620,825

EXTRUSION-COATED, BIAXIALLY ORIENTED POLYPROPYLENE FILM HAVING IMPROVED ADHESION CHARACTERISTICS

Harald Lohmann, Wiesbaden-Biebrich, and Horst Diener, Frankfurt-Hochst, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Mar. 21, 1969, Ser. No. 809,112
Claims priority, application Germany, Mar. 22, 1968, P 17 69 028.7
Int. Cl. B32b 27/32; B32h 27/08
U.S. Cl. 117—138.8 E 2 Claims

This invention relates to a biaxially oriented film of isotactic polypropylene which has improved adhesion characteristics, the film being provided on at least one surface with a coating of an isotactic polypropylene or a mixture of isotactic polypropylene and up to 15 percent by weight, based on the total weight of the polymer, of nonisotactic polypropylene, or a mixed polymer or copolymer of propylene and up to 15 percent by weight, based on the total weight of the polymer, of ethylene, the coating being substantially unoriented in the first stretching direction and less oriented than the base film in the second stretching direction.

3,620,826
PROCESS FOR IMPROVING SOILING CHARACTERISTICS OF HYDROPHOBIC TEXTILE MATERIAL

Greville Machell, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

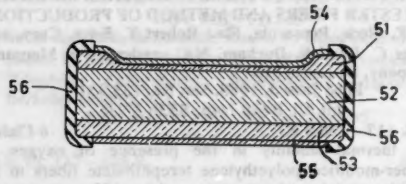
Filed July 20, 1967, Ser. No. 754,707
Int. Cl. B44d *1/50*; **D06m** *15/08*
U.S. Cl. 117—139.5CO **5 Claims**

A process for improving the soiling characteristics of hydrophobic textile material which comprises applying thereto an aqueous solution comprising a hydrophilic water dispersible polymer and irradiating the textile material. Products are also included.

3,620,827
METHOD OF APPLYING A LAYER OF SILICON NITRIDE

Marnix Guillaume Collet, Emmasingel, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed May 20, 1968, Ser. No. 730,436
Claims priority, application Netherlands, May 31, 1967, 6707515
Int. Cl. H01b *1/04*
U.S. Cl. 117—200 **7 Claims**

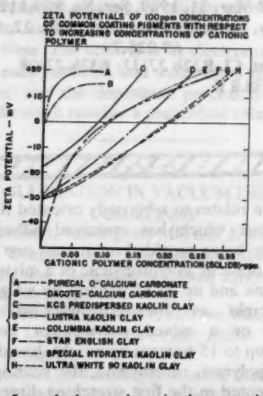


A method of applying a layer of silicon nitride to the surface of a semiconductor substrate wherein the silicon nitride is formed in a gaseous phase containing compounds of silicon and nitrogen which decompose and react in the presence of high-energy radiation e.g. ultraviolet radiation present in the gaseous phase to produce silicon nitride.

3,620,828
PROCESS FOR PRODUCING PIGMENTED ELECTROCONDUCTIVE COATING COMPOSITIONS

Fritz M. K. Werdouschegg, New Brighton, Minn., and Robert H. Windhager, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 635,523, May 2, 1967, now abandoned. This application Apr. 15, 1970, Ser. No. 28,904
Int. Cl. H01b *1/06*; **C09c** *5/24*; **G03g** *5/00*
U.S. Cl. 117—201 **19 Claims**

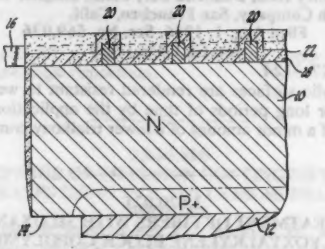

ZETA POTENTIALS OF 100ppm CONCENTRATIONS OF COMMON COATING PIGMENTS WITH RESPECT TO INCREASING CONCENTRATIONS OF CATIONIC POLYMER
ZETA POTENTIAL — mV
CATIONIC POLYMER CONCENTRATION (SOLIDS)-ppm
A—— PURECAL O-CALCIUM CARBONATE
B—— DACOTE-CALCIUM CARBONATE
C—— KCS PREDISPERSED KAOLIN CLAY
D—— LUSTRA KAOLIN CLAY
E—— COLUMBIA KAOLIN CLAY
F—— STAR ENGLISH CLAY
G—— SPECIAL HYDRATEX KAOLIN CLAY
H—— ULTRA WHITE 90 KAOLIN CLAY

A method of rendering polycationic materials compatible with anionic pigments in coating compositions is disclosed. Pigmented polycationic electroconductive polymer coatings on paper stock are used in direct electrophotographic reproduction machines. Polycationic components and anionic pigments are rendered compatible if the Zeta potential of the pigment is neutralized by the addition of a dilute cationic compound, and the electroconductive polycationic polymer is thereafter added to the pigment dispersion with a high degree of agitation. By following this procedure, the pigment dispersion remains stable, and neither the coated paper nor the dispersion stratifies or develops agglomerates.

3,620,829
COATINGS FOR GERMANIUM SEMICONDUCTOR DEVICES

Roger W. Beck, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 6, 1968, Ser. No. 726,780
Int. Cl. H01m *15/00*; **C23c** *13/04*
U.S. Cl. 117—201 **3 Claims**



A means for stabilizing the recombination velocity at a germanium surface at a minimal value. The active surface of a germanium device is coated with a material that is nonvolatile under device-operating conditions and at least as ionic in character as water. Antimony trioxide provides a particular benefit as a surface recombination velocity stabilization coating in photovoltaic devices.

3,620,830
AUTOMATIC ARC WELDING ELECTRODE WITH AN ELECTRICALLY CONDUCTIVE FLUX COATING

Arthur Kramer, South Euclid, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio

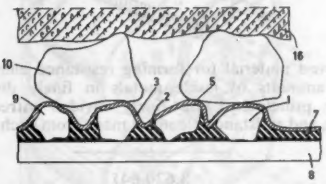
Filed Jan. 17, 1968, Ser. No. 698,526
Int. Cl. B23k *35/40*
U.S. Cl. 117—204 **13 Claims**

The invention consists of a continuous electric arc welding electrode of indefinite length consisting of a metal core and an outer coating which is electrically conductive so that the electrode can be energized by sliding it across conventional electrical contacts. The coating is comprised of: a mixture of an organic resin, which chars when heated to elevated temperatures; carbon or metal powders which conduct current through the resin; and, possibly other known fluxing ingredients. A thin outer metallic coating is often also used which conducts current from the contacts circumferentially and longitudinally to the electrically conductive coating.

3,620,831
ELECTROGRAPHIC RECORDING MEDIUM
Floyd T. Gould, Sudbury, Mass., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 30, 1968, Ser. No. 788,063
Int. Cl. B44d *1/18*
U.S. Cl. 117—201 12 Claims

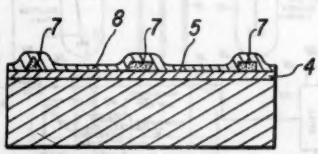
Zinc stearate, other hydrophobic metal salts of organic fatty acids, and, in some instances, the acids themselves, are coated on a substrate such as paper to provide electrographic media of unusually low cost and resistance to high humidity. The coating materials can be selected for application in powder or extruded form, from a water-compatible solvent, or from an organic solvent.

3,620,832
ELECTRODE SYSTEM PARTICULARLY SEMICONDUCTOR ELECTRODE SYSTEM AND METHOD OF PRODUCING THE SAME
Ties Siebolt Te Velde, Emmasingel, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.
Filed Apr. 11, 1967, Ser. No. 630,000
Claims priority, application Netherlands, Apr. 14, 1966, 6,604,959
Int. Cl. B44d *1/18*; H01j *1/00*
U.S. Cl. 117—210 8 Claims



An electrode system comprising a semiconductive granular layer substantially one grain in thickness is manufactured by embedding a layer of this semiconductive material in an insulating material, e.g., polyurethane so that the peaks of the grains extend substantially above the insulating material i.e., the spaces between the grains are filled to a level well below the peaks of the grains. An electrode is formed on this layer by depositing an electrically conducting layer. The so-coated layer is thereafter subjected to an abrasive on a carrier comprising grains whose average diameter is smaller than the average diameter of the electrically active grains and whose diameter exceeds the average spacing between the active grains to remove only the electrode layer covering the exposed grain peaks without abrading the grains themselves. The grain size of the abrasive is critical to avoid grains of the abrasive being lodged in the depressions between the grains of the semiconductive material and to avoid removing portions of the semiconductive grains.

3,620,833
INTEGRATED CIRCUIT FABRICATION
Paul S. Gleim, Dallas, and Kenneth E. Bean, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 23, 1966, Ser. No. 604,300
Int. Cl. C23c *13/04*; H01l *1/00*
U.S. Cl. 117—212 5 Claims

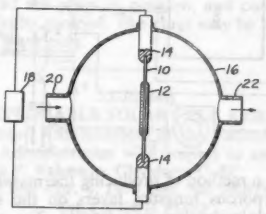


An integrated circuit structure having a plurality of monocrystalline semiconductor islands separated by a layer of dielectric insulation is fabricated by a method which begins with the formation of a plurality of nucleation sites upon a supported layer of insulating material. A single crystallite of semiconductor material is then vapor deposited at each of the nucleation sites. The crystallites are then covered by the vapor deposition of a second layer of dielectric material. The second layer of dielectric material is then supported by the deposition of a substrate material, followed by removal of the original supporting body to expose the first layer of insulating material, thereby providing a plurality of electrically isolated regions of single crystallite semiconductor material embedded in a suitable substrate. The structure is then completed by forming and interconnecting desired circuit components within the single crystallites.

3,620,834
METAL PLATING OF SUBSTRATES
James J. Duffy, Tonawanda, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
Filed July 18, 1968, Ser. No. 745,663
Int. Cl. C23b *5/62*; C23f *17/00*
U.S. Cl. 117—213 17 Claims

Various substrates, such as cellulosic, ceramic and plastic materials, are plated with metals by a process which comprises subjecting a substrate to a compound selected from the group consisting of $AsCl_3$, $SbCl_3$ and PCl_3, and thereafter subjecting the thus-treated substrate to a source of sulfide such as aqueous H_2S. The resulting treated substrate can be electroplated by conventional techniques.

3,620,835
METHOD OF MAKING NUCLEAR FUEL ELEMENTS
Karl Drittler, Geesthacht, and Hartmut Luhleich, Elbe, both of Germany, assignors to Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt m.b.H., Hamburg, Germany
Continuation-in-part of application Ser. No. 604,653, Dec. 27, 1966, now abandoned. This application June 14, 1968, Ser. No. 737,195
Int. Cl. B22f *7/02*
U.S. Cl. 117—215 4 Claims



The present invention concerns a nuclear fuel element in the shape of a wire or rod which includes: a rodlike or wirelike inner carrier element of high melting temperature metal selected from the group consisting of molybdenum, tungsten, tantalum and chromium, a layer of material selected from nuclear fuel and nuclear breeder material arranged around and supported on said carrier element and being heat resistant up to a temperature above 2,000° C., and an outer envelope surrounding said layer and selected from pyrolytic graphite and ceramics for preventing the fission products from penetrating to the outside of the fuel element.

3,620,836
BOROCARBON-COATED FILAMENTS
Charles R. Morelock, Ballston Spa, N.Y., assignor to General Electric Company
Filed Apr. 4, 1969, Ser. No. 813,691
Int. Cl. C23c *11/08*
U.S. Cl. 117—216 2 Claims

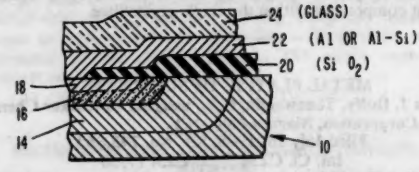
The production of borocarbon-coated filaments by the pyrolysis of a mixture of boron trichloride and a hydrocarbon gas or vapor is disclosed. The filament is electrically conductive or has an electrically conductive coating and is resistively heated to about 1,000° to 1,200° C. in the presence of the mixture. The hydrocarbon is one which will not react with the boron trichloride except at the heated substrate. A boron coating is applied to the borocarbon-coated filament by pyrolysis of a mixture of boron trichloride and hydrogen.

3,620,837

RELIABILITY OF ALUMINUM AND ALUMINUM ALLOY LANDS

Jerry Leff, Poughkeepsie, N.Y., and Arthur A. Roberts, Danbury, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 16, 1968, Ser. No. 759,898
Int. Cl. B44d *1/18*
U.S. Cl. 117—217 4 Claims



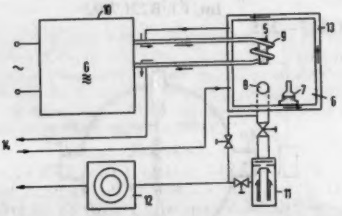
Improved reliability of aluminum and aluminum alloy lands on semiconductor integrated circuits is obtained by vapor depositing aluminum or an aluminum alloy onto a semiconductor substrate which is at a temperature between 320° and 570° C. The total thickness of the deposited aluminum or aluminum alloy is between 5,000 and 25,000 A.

3,620,838

METHOD OF DENSIFICATION OF POROUS LAYERS

Martin Peehs, and Friedrich Wendler, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Continuation of application Ser. No. 584,882, Oct. 6, 1966, now abandoned. This application Dec. 16, 1969, Ser. No. 882,398
Int. Cl. B44d *1/18*
U.S. Cl. 117—217 1 Claim



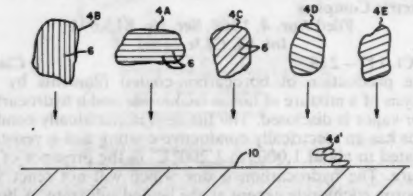
Described is a method of producing thermionic converters by densifying porous tungsten layers on the surface of a uranium dioxide/molybdenum substrate. The pores of the tungsten layer are filled by pyrolytically precipitating tungsten from the vapor phase from tungsten hexacarbonyl, $W(CO)_6$, at a substrate temperature of about 1,200° C., into the pores and onto the surface of the substrate. The CO gas developing during the densification process is withdrawn.

3,620,839

LUBRICATION OF CONTACT SURFACES

Rayond James Geckle, and Larry John Wilt, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburgh, Pa.

Filed July 28, 1969, Ser. No. 845,478
Int. Cl. B44d *1/08*; H01h *1/02*
U.S. Cl. 117—226 8 Claims



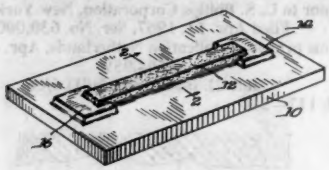
Surfaces of electrical contact members, which move relatively over each other, are lubricated with discrete particles of graphite firmly bonded to at least one of the surfaces, the particles having their basal planes extending substantially parallel to the plane of the surface, and the particles further having undergone shear so that the platelets, which comprise each particle, form an imbrecated structure on the surface. Only a minor portion of the surface is covered with the particles so that the ability of the surface to pass an electric current is not degraded. Particles may be applied by spraying the surface with a gaseous stream having entrained particles therein.

3,620,840

RESISTANCE MATERIAL AND RESISTANCE ELEMENTS MADE THEREFROM

Duane Arthur Schroeder, E. Dundee; Alvin Dennis Weiss, Chicago, and Benedict Clare Giltner, Bensenville, all of Ill., assignors to Methode Development Company, Chicago, Ill.

Filed Dec. 13, 1968, Ser. No. 783,681
Int. Cl. H01b *1/02, 5/14*
U.S. Cl. 117—227 22 Claims



Improved material for forming resistance elements using minute amounts of noble metals in finely divided form together principally with finely divided vitreous binder material; and resistance elements made from such material.

3,620,841

PROCESS FOR MAKING CONTINUOUS MAGNETITE FILMS

Richard Lawrence Comstock, San Jose, and Eugene B. Moore, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,910
Int. Cl. H01f *10/02*
U.S. Cl. 117—237 10 Claims

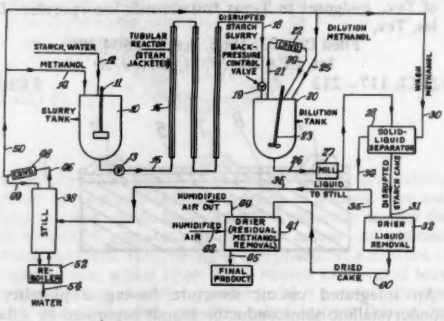
A continuous magnetite film, suitable for magnetic recording, is prepared by forming a film of amorphous Fe_2O_3, heating the Fe_2O_3 until it is completely converted to the alpha crystalline phase, and then reducing it to magnetite.

3,620,842

TEXTURIZING STARCH

Felix J. Germino, Palos Park; Francis E. Kite, Riverside, and Edwin H. Christensen, La Grange, Park, all of Ill., assignors to CPC International Inc., New York, N.Y.

Filed Sept. 18, 1967, Ser. No. 668,397
Int. Cl. C13l *1/08*
U.S. Cl. 127—32 13 Claims



Method for preparing a starch having texturizing properties from ungelatinized starch which involves mixing un-

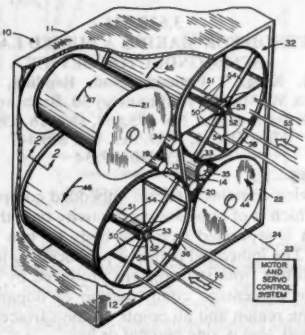
gelatinized starch with a liquid medium, the liquid medium containing 30 to 65 percent of a starch solvent and 70 to 35 percent of an organic liquid. The mixture is then reacted at a temperature between 240° and 380° F. for a period of time sufficient to substantially completely disrupt the starch granules. The starch is then removed from the liquid phase. The resulting product is cold-water-swellable, nonbirefringent, substantially completely fragmented starch. When slurried in water at a solids content of as little as 5 percent, the product exhibits texturizing characteristics by yielding a pulpy mixture. The product is particularly suitable for use in food products such as applesauce, spaghetti sauce and the like.

3,620,843

RECHARGEABLE CELL HAVING MOVING TAPE AND ROTATING ELECTRODES

John E. Clifford, Columbus, Ohio, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 5, 1969, Ser. No. 855,649
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 **57 Claims**



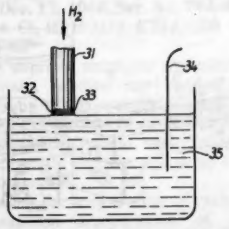
An electrically rechargeable cell comprising, in a charged state, an anode comprising a long steel tape coated on both sides with zinc forming the active surfaces, an aqueous electrolyte of potassium hydroxide saturated with zinc oxide and contained in and immobilized by a thin porous separator attached to each zinc surface, and two cylindrical rotatable air-permeable cathodes. The tape is driven from a storage reel to regions in contact with a substantial portion of each cylindrical cathode and onto a takeup reel, to utilize the zinc on both sides of the tape, at speeds dependent on the load current or voltage, or both. During charging, the tape is driven in the opposite direction.

3,620,844

SYSTEM FOR THE ACTIVATION OF HYDROGEN

Ewald Wicke, and Albrecht Kuessner, both of Muenster, Westphalia, Germany, assignors to Varta Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 80,665, Jan. 4, 1961, now abandoned , Continuation-in-part of application Ser. No. 182,247, Mar. 26, 1962, now abandoned. This application Mar. 4, 1963, Ser. No. 263,379
Int. Cl. H01m *27/06*
U.S. Cl. 136—86 **10 Claims**



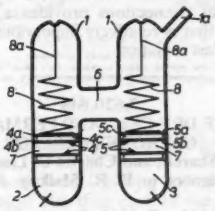
A fuel cell comprising an electrode designed for the electrochemical utilization of gaseous hydrogen, said electrode comprising a metallic body of a heavy metal lattice capable of absorbing and diffusing the hydrogen, and at least a large portion of one side of said body being in intimate contact with a dissimilar metal hydrogenation catalyst layer, consisting of a metal hydride, the catalyst of said layer being selected from the group consisting of uranium hydride, titanium hydride, thorium hydride, cerium hydride, and zirconium hydride and the metal of said lattice being selected from the group consisting of tantalum, tantalum alloys, palladium and palladium-silver alloys, and a conduit delivering the gaseous hydrogen to said one side of the metallic body.

3,620,845

WESTON STANDARD CELLS HAVING RESILIENTLY BIASSING PLUG MEANS

Ruth Friedrichs, Hannover, Germany, assignor to Pyro-Werke GmbH, Hannover, Germany

Filed June 4, 1969, Ser. No. 830,391
Claims priority, application Germany, Sept. 19, 1968, P 17 96 205.9
Int. Cl. H01m *17/04*
U.S. Cl. 136—88 **9 Claims**



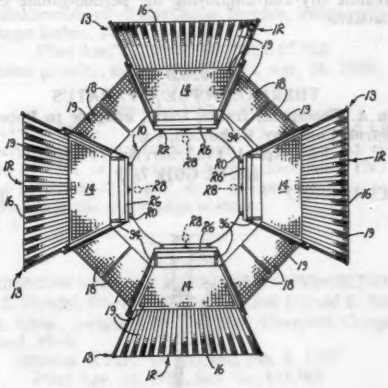
In a Weston standard cell the liquid and semiliquid electrodes are maintained in position by a plug above, and biassed towards, each electrode. Cementing resins are not needed to hold the plugs in position, and contamination of the cell is thereby avoided. The plugs may be biassed by coil springs made from glass.

3,620,846

DEPLOYABLE SOLAR CELL ARRAY

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Herman P. Valentijn, Glendora, Calif.

Filed Apr. 8, 1970, Ser. No. 26,573
Int. Cl. H01l *15/02*
U.S. Cl. 136—89 **23 Claims**



A deployable support particularly suited for use in operatively supporting arrays of solar cells aboard spacecraft, characterized by a plurality of independent modules, each including a panel formed of a plurality of trapezoidal panel segments and articulated track segments adapted to be stowed in a folded configuration and simultaneously deployed into a laterally extended and a substantially continuous surface cir-

cumscribing an associated spacecraft for positioning arrays of solar cells in an operative disposition. A particular feature of the support is an inclusion of cantilever structure which accommodates deployment of panels of solar cells in a continuous harmonic sequence for thereby substantially eliminating the normally attendant transient loading of spacecraft during panel deployment.

3,620,847

SILICON SOLAR CELL ARRAY HARDENED TO SPACE NUCLEAR BLAST RADIATION

Joseph F. Wise, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Continuation-in-part of application Ser. No. 579,801, Sept. 13, 1966, now abandoned. This application May 5, 1969, Ser. No. 821,594

Int. Cl. H01l *15/02*

U.S. Cl. 136—89 **2 Claims**

A silicon solar cell array, having the substrate, the cell-supporting grid structure, the electrical connecting leads, the cell contacts, and the terminal connections all fabricated from low atomic material such as aluminum, beryllium, or magnesium, having glass, silicon oxide and anodized aluminum insulation; silicone adhesives; and having ultrasonic welded electrical connections provides a hardened silicon solar cell array that is relatively impervious to damage from space nuclear blast radiation.

3,620,848

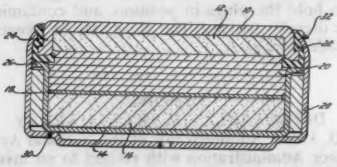
ALKALINE DRY CELL AND PERMANGANATE CATHODE THEREFOR

James Epstein, Sharon, and Charles C. Liang, Andover, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 7, 1969, Ser. No. 822,660

Int. Cl. H01m *15/06*

U.S. Cl. 136—138 **6 Claims**



A cathode depolarizer for alkaline dry cells comprised of active permanganate material having a high degree of insolubility in alkaline electrolytes. A process for producing the permanganate is set forth and the disclosure further describes an alkaline dry cell employing the permanganate cathode depolarizer.

3,620,849

THERMOCOUPLE APPARATUS

Edwin A. Thompson, Irvine, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 1, 1968, Ser. No. 717,588

Int. Cl. G01k *7/02*

U.S. Cl. 136—217 **1 Claim**

A thermocouple for attachment to a burner. The thermocouple has a mounting portion and an adapter thereon engageable with the burner. The adapter and the mounting portion are yieldably restrained against relative sliding movement to facilitate adjustment of the thermocouple relative to the burner flame.

3,620,850

OXYGEN ANNEALING

Bruce E. Deal, Palo Alto, Calif., assignor to Fairchild Camera and Instrument Corporation, Syosset, L.I., N.Y.

Continuation of application Ser. No. 531,069, Mar. 2, 1966, now abandoned. This application Mar. 25, 1970, Ser. No. 20,470

Int. Cl. H01l *7/34*

U.S. Cl. 148—1.5 **8 Claims**

A method for varying the surface charge density of a semiconductor device including the steps of heating the device prior to metallization at a temperature between 500° C. and 1,250° C. in dry oxygen and then cooling the device to a temperature below about 500° C. prior to the direct application of a metal layer to the device without an additional heating step.

3,620,851

METHOD FOR MAKING A BURIED LAYER SEMICONDUCTOR DEVICE

William J. King, 9 Putnam Road, Reading, Mass., and Frederick W. Martin, Hoffmansvej 30, Brabrand, Denmark

Division of Ser. No. 675,688, Oct. 16, 1967

Filed Dec. 4, 1969, Ser. No. 880,447

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **3 Claims**

This device contains a region imbedded completely within its body which is of opposite conductivity type than the body and which is separated from the body by two distinct PN-junctions. The imbedded region is produced by ion implantation and differs from such regions produced by other means in that the percentage compensation of dopant impurities between the region and all points on the surface of the body may be small, that is, one percent or less.

3,620,852

PROCESS FOR PRODUCING COBALT ALLOYS

Robert B. Herchenroeder, Kokomo, Ind.; Joe G. Y. Chow, Northport, and Albert H. Fleitman, Smithtown, N.Y.

Filed Feb. 27, 1970, Ser. No. 15,237

Int. Cl. C22f *1/10*; C22c *19/00*

U.S. Cl. 148—2 **2 Claims**

A process for producing oxygen-free cobalt based alloys having improved stability in high temperature irradiated sodium environments wherein cobalt is alloyed with chromium, tungsten, iron, carbon, nickel, molybdenum and titanium and thereafter the alloy is cold reduced 50 percent and heat annealed until it has a grain size of less than 10 microns.

3,620,853

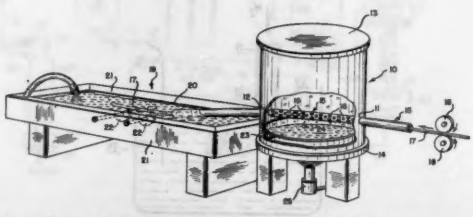
DESCALING COPPER RODS

Clermont J. Snyder, and Jack P. Moore, both of Hastings-on-Hudson, N.Y., assignors to Anaconda Wire and Cable Company

Filed Nov. 25, 1969, Ser. No. 879,767

Int. Cl. C21d *1/74*

U.S. Cl. 148—13.2 **14 Claims**



Copper rods which are coated with an oxide scale are descaled and brightened by introducing the rod at a tempera-

ture of from 800° to 1,600° F. into a descaling zone which is substantially free of oxygen. While in the descaling zone, the rod is exposed to an atmosphere which contains at least 50 percent by volume of vapors of an organic compound. The organic compound is a lower alkyl monohydroxy alcohol, a lower alkyl polyhydroxy alcohol, a lower alkyl ketone or a mixture of any of these materials. After the reaction in the descaling zone is completed, the rod is quenched in an aqueous coolant without exposure to an oxidizing environment.

3,620,854

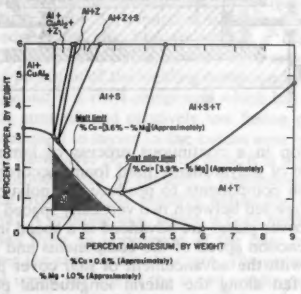
ALUMINUM CASTING ALLOY

Herbert Greenewald, Jr., Columbus, Ohio, assignor to North American Rockwell Corporation

Continuation-in-part of application Ser. No. 614,838, Feb. 9, 1967, now abandoned. This application Feb. 23, 1968, Ser. No. 711,825

Int. Cl. C22c *21/00*

U.S. Cl. 148—32 **7 Claims**



An aluminum alloy that is controlled in composition with respect to aluminum, major alloying element, grain refiner, trace element, and impurity contents to develop increased tensile strength properties in an as-cast, heat-treated, and aged condition, particularly when directionally solidified into casting configurations having a Shape Factor substantially in excess of 100.

3,620,855

SUPERALLOYS INCORPORATING PRECIPITATED TOPOLOGICALLY CLOSE-PACKED PHASES

David H. Wagner, Portland; David N. Duhl, Newington; Edward H. Van Der Molen, East Haddam, and Cornelius P. Sullivan, Branford, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 26, 1969, Ser. No. 861,496

Int. Cl. C22c *19/00*

U.S. Cl. 148—32.5 **8 Claims**

The nickel-base and cobalt-base superalloys are formed to provide, in addition to the usual strengthening mechanisms, additional strengthening and other property improvements through the precipitation of copious quantities of the topologically close-packed phases, such as the sigma phase.

3,620,856

PROCESS TO IMPROVE MAGNETIC CHARACTERISTICS OF CARBON STEEL

Hideto Hiraoka, Kamitsuchii, Gifu, Japan, assignor to Sanyo Electric Works Ltd., Kamitsuchii, Gifu, Japan

Filed Dec. 17, 1968, Ser. No. 784,405

Int. Cl. H01f *1/14;* **C21d** *1/00*

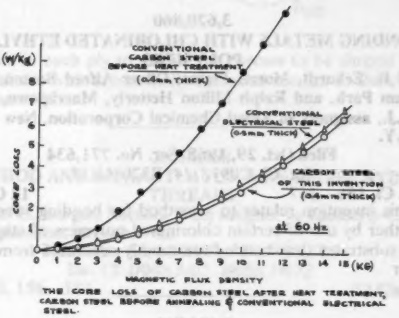
U.S. Cl. 148—121 **4 Claims**

The process to improve magnetic characteristics of conventional low-carbon, rimmed steel having the chemical composition, carbon: <0.25 weight percent, silicon: <0.5 weight percent, manganese: <1.65 weight percent, phosphorus: <0.05 weight percent, sulfur: <0.05 weight percent, copper: <0.5 weight percent, and other elements: <0.1 weight percent, comprising:

A first stage of raising the temperature of carbon steel above the A_3 transformation temperature of approximately 850–910° C. wherein the α-phase γ-phase transformation takes place in a controlled atmosphere with a dew point of approximately 5° to 50° C., or a water vapor pressure of 6.9–92.5 Torr.

A second stage of lowering rapidly the temperature of the carbon steel below 723° C., but not lower than 600° C., maintaining the carbon steel at this temperature for 3 to 10 hours in a weakly oxidizing atmosphere.

A third stage of lowering and maintaining said carbon steel at a temperature of 300 to 400° C. for 1 to 2 hours for the purpose of obtaining large ferrite grains in which less than 0.01 weight percent of carbon is present dissolved in the matrix


CONVENTIONAL CARBON STEEL BEFORE HEAT TREATMENT (0.4m/m THICK)
CONVENTIONAL ELECTRICAL STEEL (0.5m/m THICK)
CARBON STEEL OF THIS INVENTION (0.4m/m THICK)
at 60 Hz
CORE LOSS
MAGNETIC FLUX DENSITY

THE CORE LOSS OF CARBON STEEL AFTER HEAT TREATMENT, CARBON STEEL BEFORE ANNEALING & CONVENTIONAL ELECTRICAL STEEL.

and the residual carbon is present at ferrite grain boundaries, and not in the matrix.

A low-carbon, rimmed steel having a ferrite matrix and chemical composition: less than each of the following: 0.25 weight percent carbon, 0.5 weight percent silicon, 1.65 weight percent manganese, 0.05 weight percent phosphorus, 0.05 weight percent sulfur, 0.5 weight percent copper, and 0.1 weight percent other elements, and wherein the ferrite matrix is in the form of grains sufficiently large in particle size to be less than 10 particles per mm.^{2}, said grains having less than 0.01 weight percent of carbon dissolved in the ferrite matrix, and the residual carbon being present at ferrite grain boundaries and not in the ferrite matrix.

3,620,857

METHOD OF PRODUCING FINE-CRYSTALLINE CAST CHARGES WITH UNORIENTED CRYSTALLINE STRUCTURE OF 2,4,6-TRINITROTOLUENE OR EXPLOSIVE COMPOSITIONS CONTAINING 2,4,6-TRINITROTOLUENE

John Lennart Soderberg; Jarl Sigurd Back, and Christer Lennart Hakansson, all of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Apr. 17, 1969, Ser. No. 817,166

Claims priority, application Sweden, Apr. 26, 1968, 5627/1968

Int. Cl. C06b *9/04*

U.S. Cl. 149—18 **5 Claims**

Fine-crystalline cast charges with an unoriented crystal structure of TNT or explosive charges containing TNT are obtained by adding 2,2′,4,4′, 6, 6′-hexanitrostilbene to the melt from which the cast charge is made.

3,620,858

AMMONIUM NITRATE EXPLOSIVE COMPOSITION

Joseph R. Hradel, Mt. Pleasant, Mich., and Harold E. Staadt, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 784,881, Jan. 5, 1959

Filed Apr. 21, 1969, Ser. No. 818,088

Int. Cl. C06b *1/04*

U.S. Cl. 149—21 **16 Claims**

An explosive composition is provided which contains particulate ammonium nitrate, particulate metal and an aqueous phase saturated with ammonium nitrate.

3,620,859

CHEMICAL POLISHING OF METALLIC SODIUM

Hugh Solomun Isaacs, Shoreham, and Robert M. Singer, East Islip, both of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 23, 1970, Ser. No. 49,188
Int. Cl. C23g 5/02
U.S. Cl. 156—20 3 Claims

A method of preparing metallic sodium specimens for optical metallographic studies to ascertain the purity thereof whereby the sodium is polished in a bath of containing an aliphatic ketone and an aliphatic alcohol.

3,620,860

BONDING METALS WITH CHLORINATED ETHYLENE POLYMERS

Carl R. Eckardt, Morris Plains; Oliver Alfred Barton, Florham Park, and Ralph Milton Hetterly, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,634
Int. Cl. C09j 3/14; B32b 31/18
U.S. Cl. 156—247 12 Claims

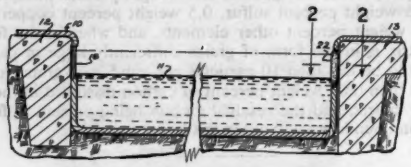
This invention relates to a method for bonding substrates together by use of certain chlorinated polymers of ethylene. The substrates thus bonded are readily separated from each other.

3,620,861

CABLE PROTECTION AND METHOD

George C. Wiswell, Jr., 1014 Pequot Road, Southport, Conn.

Filed Oct. 27, 1969, Ser. No. 869,550
Int. Cl. H01b 13/06
U.S. Cl. 156—53 2 Claims



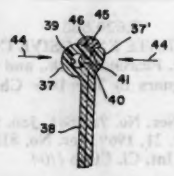
A method of placing a protective coating on cables adjacent the splash zone where a first epoxy coating is placed thereon, a porous material wrapped therearound, and a second coating placed thereon after the first has cured on sufficient amount.

3,620,862

METHOD OF MAKING CONTAINER CLOSURE

Erich-Arthur Nier, Am Erlenhang 1, 6205 Bleidenstadt, Taunus, Germany

Filed July 29, 1968, Ser. No. 748,454
Claims priority, application Germany, July 29, 1967, P 15 86 209.6
Int. Cl. B29d 31/00
U.S. Cl. 156—69 3 Claims



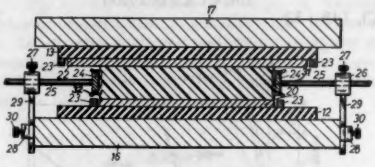
To close a container having an open mouth, a mass of synthetic resin is adhesively bonded to this mouth and/or positively interlocked therewith to form a seal with or without the aid of a separate cap also engaged by this mass. A flexible element may be projectingly imbedded in the mass to aid in the removal of the seal.

3,620,863

METHOD OF PRODUCING IN A CONTINUOUS PROCESS PLATES OF POLYURETHANE HARD FOAM WITH COVERING PLATES

Heinz Sullhofer, Niederrheinstrasse 158, 4 Dusseldorf, Germany

Filed Oct. 15, 1968, Ser. No. 767,645
Claims priority, application Germany, Oct. 16, 1967, S 112413
Int. Cl. B32b 5/18
U.S. Cl. 156—79 4 Claims



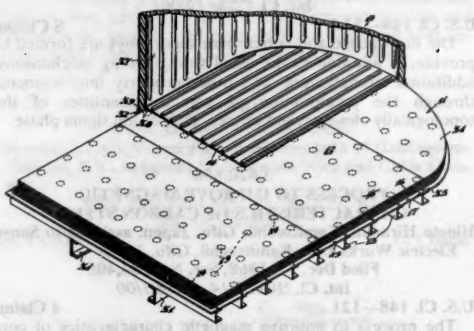
Production in a continuous process of laminated plates with a core of polyurethane hard foam, according to which the reaction components to produce the polyurethane hard foam core are fed between two vertically spaced cover plates while the cover plates are advanced at a speed in conformity with the reaction speed of the components and while simultaneously with the advancement of said cover plates lateral strips are fed along the lateral longitudinal planes which define approximately the width of the laminated plates to be produced. At least one of the upper and lower marginal ends of said strips are folded outwardly away from the core being formed so as to leave at least one longitudinal gap between the lateral strips and the respective adjacent cover plate for permitting excessive foam material to escape therethrough.

3,620,864

METHOD OF FORMING A FOAMED SANDWICH PANEL

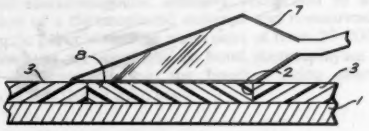
George R. Heffner, Cincinnati, Ohio, assignor to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 371,426, June 1, 1964, Patent No. 3,470,058
Filed May 28, 1969, Ser. No. 828,794
Int. Cl. B32b 5/20
U.S. Cl. 156—79 4 Claims



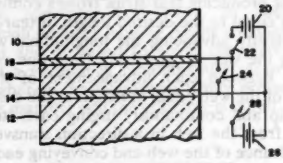
A panel adapted to receive transverse compressive stress comprising, two spaced parallel sheets, a plurality of spacers between said sheets each constituted by a tubular skin surrounding expanded plastic foam having cells elongated in a direction parallel to said skin and perpendicular to said sheets, and plastic foam expanded in the remaining volume between said sheets.

3,620,865
METHOD FOR REPAIRING FLEXIBLE MATERIALS
Harvey J. Golumbic, 1517 Sunrise Ln., Fullerton, Calif., assignor to Harvey J. Golumbic; Robert M. Bregoff and Alfred A. Calabro, part interest to each
Filed Mar. 20, 1969, Ser. No. 808,762
Int. Cl. B32b 35/00
U.S. Cl. 156—98 7 Claims



Damaged, flexible vinyl materials, such as automobile seats and tops, are repaired by a welding compound which is grained and colored to match the base material. The damaged section of the base material is prepared by removing frayed edges and the like to obtain a clean, sharp periphery. The base material is cleaned by a solvent to ensure adhesion or fusion of the welding compound with it. The welding compound is a vinyl compound which has a relatively high tensile strength and relatively low fusion point. This compound is applied in layers to the cutout area of the base material, with each layer being cured after it is applied. The final layer is smoothened to present a continuous, uninterrupted surface from the base material across the weld compound material. A graining tool, which is both hard and flexible, is obtained from an impression of the base material or material having the same grain structure. The graining tool is applied to the upper surface of the cured welding compound after it and the surrounding base material have been heated sufficiently to receive the grain impression.

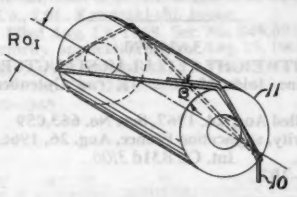
3,620,866
METHOD OF MAKING AN ELECTROCHEMICAL STORAGE CELL
Eugene C. Letter, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Division of Ser. No. 525,620, Feb. 7, 1966.
Filed Sept. 29, 1969, Ser. No. 861,969
Int. Cl. B32b 17/00
U.S. Cl. 156—102 1 Claim



Disclosed is a method for making an optical device or electrochemical storage cell wherein a pair of electron-conducting electrodes are separated by a solid-state electrolytic layer containing ions available for reversible oxidation and reduction reactions in response to an electrical potential applied across the electrodes.

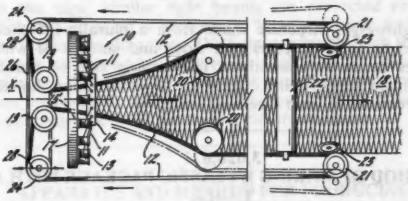
3,620,867
METHOD OF MAKING A PNEUMATIC TIRE
Donald R. Bartley, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Filed Nov. 24, 1969, Ser. No. 879,229
Int. Cl. B29h 17/20
U.S. Cl. 156—117 7 Claims

A method of making large, multiple ply, off-the-road, pneumatic tires by tape winding the carcass in a generally geodesic pattern over a cylindrical building drum. The angle of wrap with respect to the drum axis is maintained in any one ply of winding, but is increased incrementally from one ply to the next successive ply, thereby providing sufficient



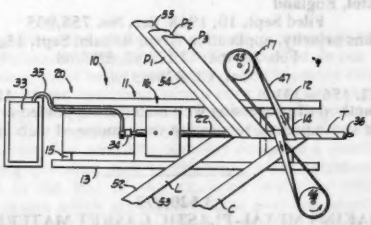
material in each ply to enable the carcass to be shaped to a toroidal tire with substantially balanced tension in the cords of adjacent plies.

3,620,868
METHOD AND APPARATUS FOR BIAS CROSSLAYING THREADS
William H. Burger, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed May 21, 1969, Ser. No. 826,576
Int. Cl. D04h 3/05; B65n 54/22
U.S. Cl. 156—181 12 Claims



A method and apparatus for forming a nonwoven web including bias crosslaid threads is disclosed in which a divergent carrier reach is formed by a pair of endless helical coil springs. The threads are wound around a narrow portion of the diverging carrier, which widens as it advances to form a broad nonwoven web. After being stabilized relative to one another the threads are then cut from the carrier.

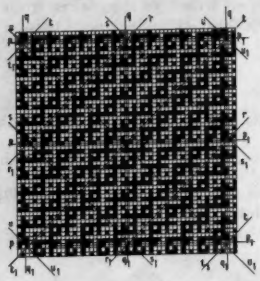
3,620,869
METHOD OF MAKING TUBES
Paul W. Stump, North Olmsted; James A. Huber, Strongsville, and John M. Lipinski, Cleveland, all of Ohio, assignors to Clevepak Corporation, Cleveland, Ohio
Filed July 16, 1969, Ser. No. 842,298
Int. Cl. B65h 81/04
U.S. Cl. 156—190 4 Claims



A helically wound tube comprised of sheetlike plies including a liner and a plurality of body plies. The liner and a first surrounding body ply are interwoven along a helical butt joint defined by adjacent edges of the surrounding body ply,

and the liner forms a helical lap joint. The tube is continuously formed and an interior protective coating is concurrently applied to the tube as an airless spray of coating material comprising 100 percent solids in a liquid state, which hardens substantially on contact with the tube.

3,620,870
LIGHTWEIGHT CELLULAR STRUCTURE
Michel Antoine Jules Maistre, 41, rue Gutenberg, Paris, France
Filed Aug. 24, 1967, Ser. No. 663,059
Claims priority, application France, Aug. 26, 1966, 74,350
Int. Cl. B31d *3/00*
U.S. Cl. 156—197 **11 Claims**



A lightweight structure made from a plurality of sheets crimped to form recesses, the sides and surface of which recesses lie in at least three intersecting sets of parallel planes, said sheets being connected together along the rims of the recesses to form a cellular structure.

3,620,871
METHOD OF MAKING A PLASTIC PACKAGE WITH A LABEL
Boye Benzon-Petersen, and Rolf Magnus Dilot, both of Lund, Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden
Filed Oct. 6, 1969, Ser. No. 864,100
Claims priority, application Sweden, Dec. 25, 1968, 15995/68
Int. Cl. B29c *17/04*
U.S. Cl. 156—212 **5 Claims**

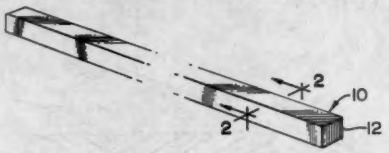
A package is formed by deep-drawing a plastic foil into a mould in which has been placed a label having at least two sidewalls and a web connecting same. The label element is provided with a heat-sensitive adhesive on its inner surface so as to be secured to the plastic package by the heat of the deep-drawing step.

3,620,872
METHOD OF MAKING LAMINATED WEB MATERIAL USING A REUSABLE CARRIER
Terence Frank Backwell, Whitchurch, Bristol, England, assignor to The Robinson Waxed Paper Company Limited, Bristol, England
Filed Sept. 10, 1968, Ser. No. 758,905
Claims priority, application Great Britain, Sept. 15, 1967, Feb. 2, 1968; 42,128/67, 5385/68
Int. Cl. B29b *3/00*
U.S. Cl. 156—231 **10 Claims**

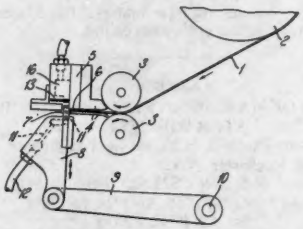
A method of processing web material supported on a carrier and subsequently separating the processed web and carrier.

3,620,873
MAKING METAL-PLASTIC GASKET MATERIALS
John E. Ehrreich, Wayland, and Adrian R. Reti, Cambridge, both of Mass., assignors to Ercon, Inc., Cambridge, Mass.
Filed Mar. 26, 1969, Ser. No. 813,400
Int. Cl. B32b *15/08*
U.S. Cl. 156—250 **18 Claims**

Compressible, resilient electrically conductive sheets or sheets or strips are made by forming a block containing compressive, conductive plastic members. These members have a parallel orientation so as to provide a plurality of parallel conducting paths. The block is then sliced into sheets or strips with the conducting paths providing electrical conductivity between opposite surfaces of each sheet or strip. By using highly thermally conductive members, one can provide enhanced thermal conductivity between opposite surfaces of a resilient, compressible plastic sheet or strip.



3,620,874
METHOD FOR PRODUCING TEAR-STRIPS
Derek Henry Youngman, and Robert William Davies, both of Deptford, London, England, assignors to The Molins Organization Limited, London, England
Division of Ser. No. 506,789, Nov. 8, 1965, Patent No. 3,502,536.
Filed June 17, 1969, Ser. No. 833,951
Int. Cl. B32b *31/18*
U.S. Cl. 156—270 **5 Claims**



A method for producing tear-strips from a continuous web having a width equal to the desired length of tear-strip comprises intermittently advancing the longitudinal web, transversely cutting the web progressively from one edge to the opposite edge between each advancement of the web to sever portions of the web equal in length to the desired width of the tear-strip and continuously urging each strip as it is being severed from the web in a direction transverse to the direction of advance of the web and conveying each cut strip in a direction opposite to the direction the web is progressively cut.

3,620,875
ELECTROMAGNETIC ADHESIVE AND METHOD OF JOINING MATERIAL THEREBY
Richard J. Guglielmo, Sr., Cresskill, N.J., and Nishan G. Chookazian, Saddle Brook, N.Y., assignors to EMA Corporation, Northvale, N.J.
Continuation-in-part of application Ser. No. 417,804, Dec. 11, 1964, now abandoned , Continuation of application Ser. No. 500,168, Oct. 21, 1965, now abandoned. This application July 28, 1969, Ser. No. 849,244
Int. Cl. B29c *27/04;* **C08f** *45/04;* **C08k** *1/02*
U.S. Cl. 156—272 **13 Claims**

Electromagnetic adhesive comprised of a mixture of a thermoplastic material and ferromagnetic particles having mesh sizes of from 20–200 mesh. The adhesives are employed to bond thermoplastics by the use of inductive heating, the bonding being effected in period of less than two minutes.

3,620,876

LIQUID ELECTROMAGNETIC ADHESIVE AND METHOD OF JOINING MATERIALS THEREBY

Richard J. Guglielmo, Sr., Lambs Lane, Cresskill, N.J., and Nishan G. Chookazian, 580 Oak Ave., Saddle Brook, N.Y.

Continuation of application Ser. No. 500,294, Oct. 21, 1965. This application July 28, 1969, Ser. No. 849,245

Int. Cl. B29c *27/04*; C08f *45/04*; C08k *1/03*

U.S. Cl. 156—272 17 Claims

Liquid electromagnetic adhesive comprised of a liquid dispersion of a thermoplastic material and noncorrosive ferromagnetic particles having mesh sizes of from 20–200 mesh. The adhesives are employed to bond thermoplastics by the use of inductive heating, the bonding being effected in periods of less than 2 minutes.

3,620,877

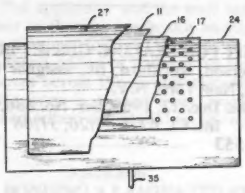
METHOD OF MAKING ELECTROTYPE PRINTING PLATES

Robert E. Anderson, Kalamazoo, Mich., assignor to Mueller Color Plate Company, Battle Creek, Mich.

Filed July 25, 1968, Ser. No. 754,132

Int. Cl. B32b *31/04*

U.S. Cl. 156—285 5 Claims



The method of manufacturing an electrotype printing plate comprising the steps of electroforming a shell having raised characters on its front face and corresponding recesses on its backface, fusing a nylon coating to the back of the plate to fill the recesses, providing a metallic backing plate having a predetermined curvature, applying thermosetting adhesive to one of the backing plate or the coating. The plate is applied to vacuum apparatus comprising an apertured saddle member which includes heating means and diaphragm means constructed and arranged to cover the plate. The plate is heated and a vacuum is simultaneously drawn through the apertures wherein the diaphragm firmly presses the plate to the backing member and the adhesive is cured.

3,620,878

BONDING WITH ETHYLENE COPOLYMER ADHESIVE AND ADHESION PROMOTING AGENT

James L. Guthrie, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed July 26, 1968, Ser. No. 747,826

Int. Cl. C09j *3/14*

U.S. Cl. 156—309 1 Claim

Polar copolymers of alpha-olefins containing pendant ester, amide, anhydride or carboxylic acid groups may be bonded to wood, metal or other substrates by blending di- or polycarboxylic acids in the approximate proportions of 1–15 percent into the polar copolymers. The di- or polycarboxylic acids when compounded in the copolymer develop peel strengths of approximately from 30–70 lbs./inch when interposed between metallic or wood sheets and held under pressure from 1–15 minutes at temperatures above the melting point of the copolymer.

3,620,879

APPARATUS FOR CONTINUOUSLY DETERMINING THE DIAMETER OF MASK APERTURES

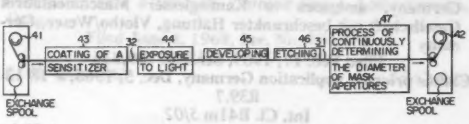
Hitoshi Imamura, Hiratsuka-shi, and Hiroshi Ishino, Yokohama-shi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 13, 1969, Ser. No. 849,695

Claims priority, application Japan, Aug. 15, 1968, Aug. 19, 1968, Oct. 3, 1968; 43/57814, 43/58692, 43/71605

Int. Cl. C23f *1/02*; G01n *21/00*

U.S. Cl. 156—345 13 Claims



Apparatus for continuously and successively determining the diameter of mask apertures in a plurality of masks formed in an elongated tape material which is moving at a substantially constant speed, the tape having a series of equally spaced perforated masks thereon and start- and stop-detecting apertures near the front and rear edges of each mask. The start aperture is detected and a slider device is operated to engage with the traveling tape to thereby travel with the tape. Upon detection of the stop-detecting aperture, the slider device is released from the tape and is quickly returned to its original position. While the slider is engaged with the tape, similar light beams are projected on corresponding areas of a mother or "master" mask and of a mask on the traveling tape. The light passing through the two masks is converted to electrical signals and the electrical signals are compared. The respective masks of the tape are either approved or rejected as a function of the magnitude of the difference between the output electrical signals.

3,620,880

APPARATUS AND METHOD FOR PRODUCING COMPOSITE MATERIALS

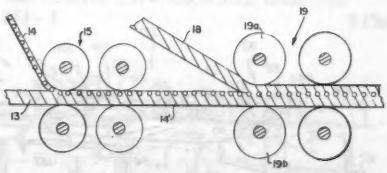
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J.

Continuation-in-part of application Ser. No. 500,731, Oct. 22, 1965, now Patent No. 3,436,816, which is a continuation-in-part of application Ser. No. 241,904, Dec. 3, 1962, now Patent No. 3,276,513 and Ser. No. 393,292, Aug. 31, 1964

This application Ar. 7, 1969, Ser. No. 813,928

Int. Cl. B32b *3/10*; B41m *1/26*

U.S. Cl. 156—384 9 Claims



An apparatus and method for producing composite materials and the materials made thereof are provided. In one form, one or more sheet metal materials are continuously extruded to shape and are combined with a core material in a rolling mill to provide a composite structure having improved characteristics imparted thereto by both core and encapsulating materials. The core material may comprise a plurality of reinforcing elements such as filaments, wires, whiskers or a grid fed to the bite of two extruded sheets or otherwise formed shapes which are made to flow over and around the reinforcing elements and to encapsulate same therebetween as the two sheets are roll bonded or welded together and reduced in thickness to form a third composite sheet formation thereof.

In another form, individual articles are disposed on top of a first freshly extruded sheet and are encapsulated in a composite sheet formed of said first sheet and a second sheet

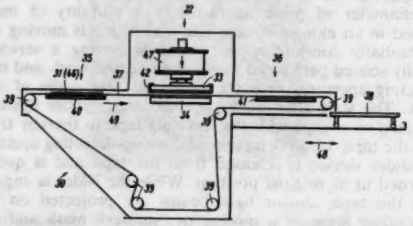
disposed thereagainst and roll bonded thereto in a rolling mill. The oxide free, high-temperature condition of the two sheets, as extruded, is utilized to fabricate improved composite sheet materials without the difficulties normally experienced in fabricating sheet materials from cold stock.

3,620,881

APPARATUS FOR PRINTING BOTH SIDES OF SINGLE OR MULTIPLE LAYER TEXTILE ARTICLES

Herbert Kannegiesser, Vlotho, Weser; Jean Pierre Niederst, Schotmar, and Richard Juraschek, Vlotho, Weser, all of Germany, assignors to Kannegiesser Maschinenfabrik Gesellschaft mit beschrankter Haftung, Vlotho/Weser, Germany

Filed Feb. 17, 1969, Ser. No. 799,836
Claims priority, application Germany, Dec. 5, 1968, P 18 12 839.7
Int. Cl. B41m *5/02*
U.S. Cl. 156—388 **1 Claim**



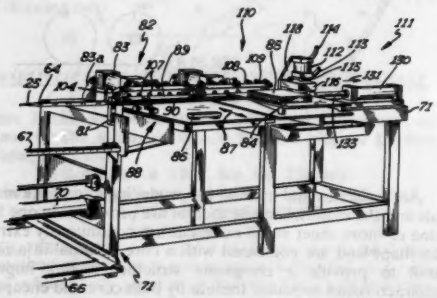
The invention provides a method of and an apparatus for printing both sides of single or multiple layer textile articles, which method comprises the steps of covering both sides of a single or multiple layer textile article with a transfer printing sheet, conveying said article and said sheets between two relatively spaced heated pressing platens, and closing the platens and thereby simultaneously transferring impressions from said transfer printing sheets to each side of said article.

3,620,882

APPARATUS FOR MANUFACTURING AN ALBUM PAGE

Tien S. Chou, Minneapolis; Wilfred T. Tonnell, St. Cloud, and Roger A. Wenstrom, St. Cloud, all of Minn., assignors to The Holes-Webway Co., St. Cloud, Minn.

Filed June 11, 1970, Ser. No. 45,514
Int. Cl. B31f *1/00*; **B32b** *3/04*
U.S. Cl. 156—461 **10 Claims**



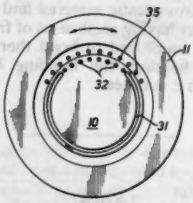
Apparatus for manufacturing an album page wherein a tape is folded longitudinally and is applied to the album page and has secured thereto staplelike hinge elements. A tape supply mechanism is provided for advancing a continuous strip of tape in a predetermined direction, the tape being engaged and scored by a scoring mechanism to facilitate folding thereof. A stitching mechanism for applying the staplelike hinge elements to the tape and means for applying the longitudinally folded tape to one longitudinal edge of the album page.

3,620,883

APPARATUS FOR EXTRUDING PLASTIC NETTING

George S. Nalle, Jr., 108 West Second St., Austin, Tex.

Filed Sept. 25, 1968, Ser. No. 762,519
Int. Cl. B29c *17/00*
U.S. Cl. 156—500 **8 Claims**



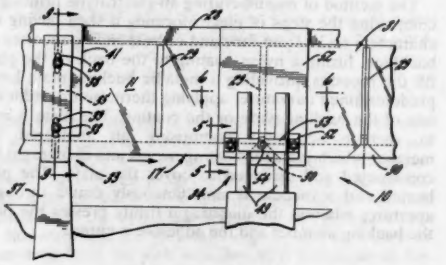
This application discloses extrusion die head assemblies and mthods for extruding plastic to produce solid or filamentary ribbonlike products with net or openwork overlay. A center die has an extrusion opening or openings defining a straight line or other open figure, while a circular rotating die surrounds the center die to produce a netlike pattern which is partially fused with the portion extruded from the center.

3,620,884

SEALING UNIT FOR SEALING GUSSET BOTTOM BAGS

Donald T. Peterson, Rockford, Ill., assignor to Riegel Paper Corporation, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 886,980
Int. Cl. B32b *31/20*, *31/08*
U.S. Cl. 156—553 **4 Claims**



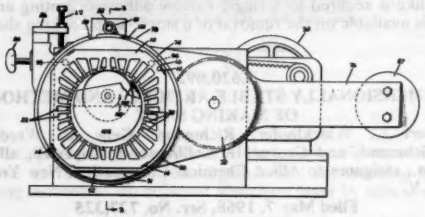
A sealing unit for sealing together face-to-face strips of flexible material joined along their bottoms by a fold which is tucked upwardly to form a gusset of W-shaped cross section along the fold, the strips being advanced lengthwise and in upright planes along a predetermined path. The sealing unit comprises a primary rectangular seal bar and, spaced downstream therefrom, a gusset seal bar and a secondary rectangular seal bar, the seal bars being operable to seal the strips in such a manner as to form a series of gusset bottom bags. To enable the sealing of strips of various heights with only minor changes in the sealing unit, the primary rectangular seal bar seals the strips through a protective curtain which covers the strips except for the gusset and which allows the primary rectangular seal bar to extend downwardly alongside the gusset without pressably engaging the latter while sealing crosswise of the remainder of the strips. In order to enable the sealing of strips of various thicknesses, the gusset seal bar is mounted for adjustment laterally of the strips and relative to the secondary rectangular seal bar.

3,620,885

APPARATUS FOR APPLYING UNHARDENED ADHESIVE MATERIAL TO A LAMINATED STRUCTURE

Leo M. Schlaudroff, Fort Wayne, Ind., assignor to General Electric Company

Filed Feb. 16, 1970, Ser. No. 11,738
Int. Cl. H02k 15/12; B32b 31/12
U.S. Cl. 156—563 8 Claims



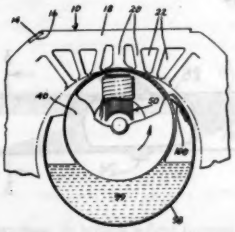
An apparatus for applying an adhesive bonding material to a stack of laminations forming a laminated core for use in an inductive device, the core having a plurality of spaced-apart tooth sections with at least some of the laminations having spaces therebetween at the termination portions of the tooth sections. The apparatus includes an applicator, carrying on its periphery unhardened adhesive material, and means for mounting the core for engaging the termination portions of the at least some of the laminations with the unhardened adhesive material. The applicator and the core are moved relative to one another so that the applicator moves sequentially across the termination portions of the tooth sections for applying the unhardened adhesive material to the core. After the applicator moves across the termination portions of the tooth sections, the core is moved away from engagement with the unhardened adhesive material on the applicator.

3,620,886

METHOD FOR BONDING A LAMINATED STRUCTURE AND APPARATUS FOR APPLYING UNHARDENED ADHESIVE MATERIAL TO THE LAMINATED STRUCTURE

Marion W. Sims, and Francisco C. Avila, both of Fort Wayne, Ind., assignors to General Electric Company

Filed Feb. 16, 1970, Ser. No. 11,739
Int. Cl. B32b 31/20; H02k 15/02
U.S. Cl. 156—563 13 Claims



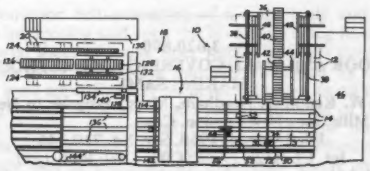
Method and apparatus for applying unhardened adhesive material to a stack of laminations forming a laminated core for use in an inductive device, the core having spaced-apart tooth sections with at least some of the laminations having spaces therebetween at the termination portions of the tooth sections. The core is mounted to engage unhardened adhesive material carried on the peripheral surface of an applicator and relative motion is provided between the applicator and core for transferring unhardened material from the applicator to at least some of the laminations. An electromagnet is positioned adjacent at least some of the laminations and energized to apply a magnetic field to the core for ensuring separation of at least some of the laminations as the unhardened adhesive material is being applied to the termination portions thereof. The laminations may then be clamped together until the adhesive material hardens to firmly bond the laminations together, and this hardening step may be accomplished by placing the core in an oven which generates heat to cure or harden the adhesive material. The process may further include the step of applying an insulating material to selective surfaces of the core to form an integral insulating coating thereon.

3,620,887

METHOD AND APPARATUS FOR ASSEMBLING VENEER PLIES INTO LAID-UP PLYWOOD PANELS

Victor R. Nelson, 2700 S.W. Summit Drive, Lake Oswego, Oreg.

Filed June 4, 1968, Ser. No. 734,466
Int. Cl. B32b 31/10, 31/20
U.S. Cl. 156—563 15 Claims



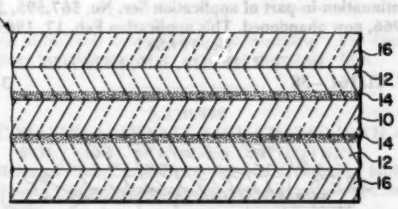
Bottom veneer plies are arranged end to end and conveyed continuously under a core assembly unit where core strips are crowded together in edge-abutting relationship, trimmed to desired panel width and laid upon the bottom plies, after which overlay veneer plies are laid end to end over the core ply and the assembly conveyed to a cutoff unit where it is cut to plywood panel lengths for subsequent stacking and delivery to a press.

3,620,888

TRANSPARENT LAMINATE HAVING AT LEAST ONE LAYER OF A CELLULOSE DERIVATIVE MATRIX CONTAINING INFRARED ABSORBER

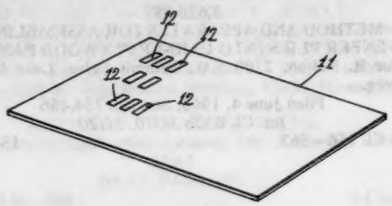
Harold O. Buzzell, Wollaston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 2, 1966, Ser. No. 577,578
Int. Cl. B32b 23/14; G02b 5/22; G02c 7/10
U.S. Cl. 161—1 9 Claims



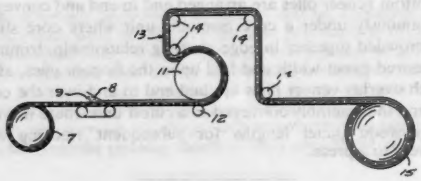
Novel improved dye layers especially suitable for use in plastic laminations, such as those involved in plastic optical products. The layer comprises a dye substantially uniformly dispersed in a cellulose derivative matrix wherein one surface of the matrix has been converted to cellulose.

3,620,889
LIQUID CRYSTAL SYSTEMS
Donald H. Baltzer, Cincinnati, Ohio, assignor to Vari-Light Corporation, Cincinnati, Ohio
Filed June 11, 1968, Ser. No. 736,119
Int. Cl. B44f *1/00*; C09k *3/00*
U.S. Cl. 161—5 17 Claims



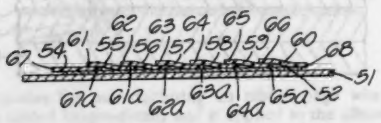
Systems incorporating liquid crystals which are thermally sensitive and optically responsive to temperature changes.

3,620,890
FLOOR AND WALL COVERING AND METHOD OF MAKING SAME
James W. Kemmler, Needham, Mass., assignor to New London Mills, Inc., New London, Conn.
Filed Mar. 4, 1968, Ser. No. 710,146
Int. Cl. B32b *27/00*; C09j *5/00*; B44l *1/00*
U.S. Cl. 161—6 7 Claims



A method for forming a decoratable, multilayer floor and wall covering comprising coating a fibrous reinforcing layer with a resilient backing, coating the opposite side of the fibrous layer with a gellable polymeric material, and gelling the polymeric material, against a smooth surface. The product formed by this process comprising layers of resilient backing, fibrous reinforcing, and gelled polymeric material, suitable for decoration.

3,620,891
RECEIPT BINDERS
John Leslie Jones, Sr., 1070 Glen Oaks Blvd., Pasadena, Calif., and John Leslie Jones, Jr., 1447 Sutherland St., Los Angeles, Calif.
Continuation-in-part of application Ser. No. 567,595, July 25, 1966, now abandoned. This application Feb. 17, 1969, Ser. No. 799,887
Int. Cl. B32b *3/16*, *3/10*; B42d *1/10*
U.S. Cl. 161—38 3 Claims



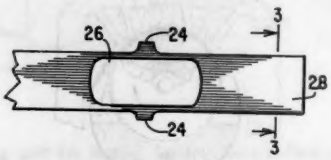
This invention teaches binders, a manufacturing process and manufacturing apparatus for binders, sales receipts, checks, and like sheets of paper the binders having thin film base sheets with at least two opposed edges, and having at least one pressure sensitive adhesive coating strip area extending over one strip section area of the base sheets, the adhesive coating strip area being coterminous with two opposed film base sheet edges. A multiplicity of release coated face, flexible, narrow strip backing sheets are arranged in parallel alignment with adhesive coating strip area, with the release coated faces of the strip backing sheets adjacent to and completely covering the adhesive coating strip area. The multiplicity of strip backing sheets are coterminous at their strip ends with the coterminous adhesive coating strip area and the opposed base sheet edges. A single-receipt sheet or the like is secured to a single-narrow adhesive coating area, made available on the removal of a single-strip backing sheet.

3,620,892
DIMENSIONALLY STABLE ARTICLES AND METHOD OF MAKING SAME
Robert C. Winckhofer, Richmond; Gene C. Weedon, Richmond, and George H. Collingwood, Hopewell, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.
Filed May 7, 1968, Ser. No. 727,325
Int. Cl. D04h *1/04*; D03d *15/02*; D02g *3/36*
U.S. Cl. 161—89 15 Claims

Dimensionally stable articles are produced from heat-treating fabric comprised of multiconstituent filaments prepared from blended fiber-forming polymeric materials having different properties, at least one of the fiber-forming polymeric materials being dispersed as discontinuous fibrils in a lower melting matrix formed by another polymeric material, and natural or synthetic filaments which may or may not have heattreating capabilities. The article is produced by preforming the fabric, during production of the fabric itself or by subsequent operation, and heating the latter to a temperature equal to or above the melting temperature of the multiconstituent matrix material but below that of the dispersed polymeric material, for a time sufficient to impart a shape stabilized property to the multiconstituent filaments and consequently to the fabric article.

The multiconstituent filaments are present in the fabric as individual yarn or filament elements in combination with other materials, or are present in a mechanically blended fiber or yarn with other materials.

3,620,893
FILM END CONSTRUCTION FOR SELF THREADING DEVICE
Irvin S. Tarrson, Evanston, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Nov. 4, 1969, Ser. No. 873,871
Int. Cl. B32b *3/10*
U.S. Cl. 161—109 3 Claims

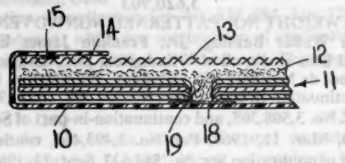


A novel film end construction for facilitating the self-threading of a film handling device.

3,620,894
INCONTINENCE PADS
Frank Oates, Birmingham, England, assignor to Southalls (Birmingham) Limited, Birmingham, England
Filed Aug. 25, 1969, Ser. No. 852,551
Claims priority, application Great Britain, Sept. 9, 1968, 42,770/68
Int. Cl. B32b *3/06*, *3/10*
U.S. Cl. 161—114 2 Claims

An incontinence pad comprising a moisture impervious backing sheet and a moisture pervious surfacing sheet, the

two sheets having layers of absorbent material therebetween, the layers of absorbent material being spiked before assembly



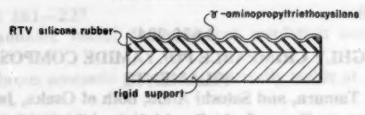
between the sheets to produce interlocking elements which serve to retain the layers together and the backing sheet being secured to the adjacent absorbent layer by adhesive.

3,620,895

CORRUGATED MICROPERMEABLE MEMBRANE

James L. Bailey, Dover, and Franklin A. Rodgers, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1969, Ser. No. 788,707
Int. Cl. B32b *3/00*
U.S. Cl. 161—123 **7 Claims**



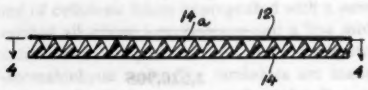
Corrugated porous membranes made of polyvinylidene fluoride may be satisfactorily molded using a silane modified room temperature vulcanizable silicone rubber mold.

3,620,896

CLAMPING TAPE

Paul J. Glasgow, Woodmere, N.Y., assignor to Glasgow Products, Inc., Woodmere, N.Y.

Filed July 31, 1968, Ser. No. 749,215
Int. Cl. B32b *3/28, 3/30*
U.S. Cl. 161—123 **12 Claims**



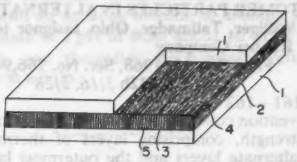
A multilamina tape in which a first lamina has the property of substantial contraction and a second lamina attached thereto has the property of negligible contraction resulting in a coiling of the tape during contraction of the first lamina. The first lamina may be heat-, chemical- or radiation shrinkable. A preferred embodiment employs a linearly prestretched thermoplastic with a memory for its normal configuration to which it shrinks upon being activated to reach its plastic state with heat. The second lamina is formable thereby assuming a coiled configuration and may be serrated to provide a controlled direction of coil, ease of coiling due to increased flexibility in the direction of coiling and transverse rigidity perpendicular to the direction of coiling. Adhesive—heat, solvent or pressure activated—on the innermost surface of the coiled configuration serves to bond the coil to itself and to items contained thereby to form a permanent wrap or tie.

3,620,897

CONVEYOR BELTS AND PROCESS FOR THEIR MANUFACTURE

Katsukiyo Tanimoto; Tamio Urakami, and Sotaro Itadani, all of Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

Filed July 2, 1969, Ser. No. 838,502
Claims priority, application Japan, July 2, 1968, July 2, 1968; 43/46052, 43/56189
Int. Cl. B32b *25/10;* **B65g** *15/34*
U.S. Cl. 161—154 **17 Claims**



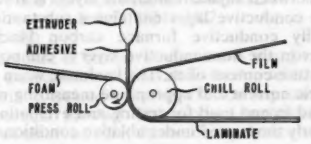
A conveyor belt consisting of a core body and rubber covers interposing said core, the core body being formed of a nonwoven sheet of staple fiber webs, the fibers constituting the nonwoven sheet being mutually entangled by needling and at least approximately 80 percent thereof being oriented in longitudinal direction of the belt by drawing of the nonwoven sheet in longitudinal direction, and the nonwoven sheet being sufficiently impregnated with an adhesive. Such conveyor belt is prepared by a process which comprises needling a web of 200–1,000 g./m.^{2} formed of crimped and 40–120 mm. long staple fibers at a needling density of 50–250 times/cm.^{2}, drawing the needled web in its longitudinal direction by at least 50 percent; impregnating the nonwoven sheet with an adhesive to produce a core body; and pressing rubber covers onto the top and bottom surfaces of such core body. The impregnation of the needled web with the adhesive may be conducted prior to drawing.

3,620,898

HEAT SHRINKABLE CUSHIONING MATERIAL

Roland G. Harris, Chadds Ford, Pa., and Joseph Henry Ryan, Jr., Claymont, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 31, 1968, Ser. No. 788,157
Int. Cl. B32b *3/12*
U.S. Cl. 161—160 **7 Claims**



A heat shrinkable foam laminate comprising a low density foam sheet bonded to at least one heat shrinkable film.

3,620,899

DECORATIVE LAMINATE BACK COATED WITH A POLYVINYL ACETATE COMPOSITION

Peter Bernard Kelly, and Gene Edward Grosheim, both of Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed Apr. 16, 1968, Ser. No. 721,589
Int. Cl. B32b *27/10, 27/30, 27/42*
U.S. Cl. 161—162 **6 Claims**

An adherable surface coating composition consisting essentially of an aqueous latex dispersion of (A) a water dispersible polyvinyl acetate composition having a molecular weight between about 20,000 and 250,000, having a cold flow test value of from about 20 to 2,000, and having a particle size range from about 0.1 to 25 microns, containing from

about 0 percent to about 15 percent by weight, based on the weight of the polyvinyl acetate composition solids of a plasticizer, (B) from about 1 percent to about 10 percent, by weight, based on the weight of the polyvinyl acetate composition solids, of a protective colloid for (A), and (C) from about 0.1 percent to about 3 percent, by weight, based on the total weight of the dispersion of a water soluble starch and decorative laminates coated on their back sides with said coating composition.

3,620,900

PLASTIC LAMINATE STRUCTURE HAVING ELASTOMER PARTICLES IN ALTERNATE LAYERS

Ervin J. Williger, Tallmadge, Ohio, assignor to The General Tire & Rubber Company

Filed Oct. 11, 1968, Ser. No. 766,947

Int. Cl. B32b *5/16, 5/28*

U.S. Cl. 161—162 **6 Claims**

This invention concerns a laminate, possessing high reverse impact strength, comprising layers of thermosetting resin wherein alternate layers and the outermost layers, have incorporated therein a dispersion of elastomeric particles.

3,620,901

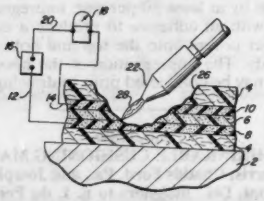
ELASTOMERIC LAMINATE COMPOSITION

Walter A. Hartz, Cuyahoga Falls; Daniel A. Meyer, Akron, and John G. Sommer, Jr., Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Company

Continuation-in-part of application Ser. No. 381,486, July 9, 1964, now abandoned. This application June 23, 1969, Ser. No. 835,675

Int. Cl. B32b *25/02, 25/12*

U.S. Cl. 161—162 **5 Claims**



A laminate is composed of alternate layers of electrically conductive and electrically nonconductive carbonizable, millable elastomeric compositions, wherein the difference in resistivity between adjacent alternate layers is at least 10^8 ohm-cm. The conductive layer contains a substantial amount of electrically conductive furnace carbon black while the elastomer in the nonconductive layer is compounded with a low moisture content silica. The laminate, when connected to an electric current and appropriate measuring means, can be embedded in and used for testing and evaluating insulations, particularly those used under ablative conditions.

3,620,902

LAMINATES PREPARED FROM C —C SUBSTITUTED PHENOL-FORMALDEHYDE RESINS

George J. Anderson, Wilbraham, and Ronald H. Dahms, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 588,310, Oct. 21, 1966, now abandoned , and a continuation-in-part of 605,531, Dec. 29, 1966, now abandoned , and a continuation-in-part of 676,062, Oct. 18, 1967, now abandoned , and a continuation-in-part of 676,039, Oct. 18, 1967, now abandoned , and a continuation-in-part of 676,043, Oct. 18, 1967, now abandoned. This application June 21, 1968, Ser. No. 738,798

Int. Cl. B32b *27/42;* **C08g** *5/08*

U.S. Cl. 161—165 **5 Claims**

Laminates made from phenolic resin impregnated cellulosic substrates. The phenolic resin used is made from a substituted phenol and formaldehyde. The substituted phenol is made by reacting a specific C_8 through C_{13} mixture of carbocyclic compounds. The product laminates have an improved combination of water absorption, solvent-resistance, heat-resistance, electrical properties, and physical properties.

3,620,903

LIGHTWEIGHT NONPATTERNED NONWOVEN FABRIC

William Wallar Bunting, Jr.; Franklin James Evans, and David Ellis Hook, all of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 834,788, June 19, 1969, Pat. No. 3,508,308, and continuation-in-part of Ser. No. 712,070, Mar. 11, 1968, Pat. No. 3,493,462, continuation-in-part of application Ser. No. 584,627, Sept. 22, 1966, now abandoned, division of Ser. No. 208,136, July 6, 1962, abandoned. Filed Jan. 29, 1970, Ser. No. 6,963. The portion of the term of the patent subsequent to Feb. 3, 1987 has been disclaimed

Int. Cl. D04h *3/08;* **D06c** *1/06*

U.S. Cl. 161—169 **5 Claims**

Lightweight, nonpatterned, nonwoven fabrics suitable for use as wearing apparel are produced by treating fibrous sheet materials with fine, essentially columnar streams of liquid jetted from orifices under high pressure. A layer of fibrous material is supported on a nonpatterning surface and traversed with the streams to entangle the fibers in a manner which imparts strength and stability without the need for binder. A smooth fabric surface is provided by use of broken streams or by rapid oscillation of the streams.

3,620,904

HIGHLY CRIMPABLE POLYAMIDE COMPOSITE FILAMENTS

Yoshio Tamura, and Satoshi Ando, both of Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan and Snia Viscosa, Milan, Italy

Continuation-in-part of application Ser. No. 671,217, Sept. 28, 1967, now Patent No. 3,551,277. This application July 23, 1970, Ser. No. 57,771

Int. Cl. D02g *3/02*

U.S. Cl. 161—173 **13 Claims**

Production of polyamide composite filament having high crimpability, one component of which is polycapramide and the other component of which is a copolyamide consisting of 0.01 to 5 percent by weight of nylon salt composed of a dicarboxylic acid and a polyfunctional diamine having the general formula

$$H_2N-(CH_2)_n-R(CH_2)_nNH_2$$

wherein R is $>C\quad O$ and n is 3 to 11, 3 to 20 percent by weight of another nylon salt and 75 to 95 percent by weight of polycapramide forming components.

3,620,905

OPTICALLY CLEAR THERMOPLASTIC POLYURETHANES

Leo Ahramjian, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1969, Ser. No. 868,235

Int. Cl. B32b *17/10*

U.S. Cl. 161—190 **11 Claims**

Colorless, optically clear, thermoplastic polyurethanes prepared from diisocyanato-dicyclohexylmethane containing 10–100 percent trans-trans 4,4'-methylenebis(cyclohexyl isocyanate) (PICM), a polyether or polyester glycol having a molecular weight of 500–3,000 and a diol having a molecular weight below 250. The low molecular weight diol is reinforcing when the isocyanate contains 30 percent or less trans-trans PICM and nonreinforcing when the isocyanate contains greater than 30 percent trans-trans PICM. The polyurethanes are particularly suitable for use in laminates for safety and bullet-proof glass.

3,620,906

GLASS FIBER LAMINATES AND METHOD

George John Hannes, Maumee, Ohio, assignor to Johns-Manville, FiberGlass Inc., c/o Prentice Hall Corporation System, Inc., Cleveland, Ohio

Continuation of application Ser. No. 338,484, Jan. 17, 1964, now abandoned , which is a continuation of application Ser. No. 778,381, Dec. 5, 1958, now abandoned. This application Feb. 25, 1970, Ser. No. 14,221

Int. Cl. B32b *17/10, 31/08*

U.S. Cl. 161—203 13 Claims

A panel for use as an acoustical panel or automobile headliner comprising a combination of resilient body of resin-bonded fiber and a covering decorative surfacing cloth united together with an intermediate thermoplastic sheet, and a method of forming such panel comprising superimposing the said components upon each other with a thermoplastic sheet intermediate thereof and compressing the assembly while heating to fuse the intermediate thermoplastic sheet to each of said body of resin binder with fiber and covering decorative surfacing cloth.

3,620,907

LAMINATE WITH LAYERS OF POLYIMIDE AND POLYAMIDE

Edward L. Yuan, Philadelphia, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1969, Ser. No. 873,123

Int. Cl. B32b *27/06*

U.S. Cl. 161—227 8 Claims

A laminate useful for electrical insulation comprising layers of:

A. a fibrous aromatic polyamide thermally stable at 180° C.; and

B. a polyimide; and

C. situated between layers A. and B., a precursor of a polyimide, said precursor having been sufficiently converted into a polyimide to cause layers A. and B. to be adhesively secured to each other.

3,620,908

COLD PUNCHABLE CRESYLIC LAMINATES

Ronald H. Dahms, Springfield, and George J. Anderson, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed June 21, 1968, Ser. No. 738,794

Int. Cl. B32b *27/10, 27/30, 27/42*

U.S. Cl. 161—248 7 Claims

Impregnated cellulosic sheets and laminates which are cold punchable and have good electrical properties. The sheets are formed of cellulosic fibers impregnated with a mixture of a carboxylated alkadiene interpolymer and a low molecular weight phenol-formaldehyde resin and then over treated with a cresol-formaldehyde resin. The laminates are made from suitably advanced such impregnated sheets by first stacking and thermosetting under appropriate heat and pressure.

3,620,909

METHOD FOR RECLAIMING PULP FROM WASTE PAPERS

C. Roy Gleason, Chicago, Ill., assignor to Waste Paper Reclamation Corporation, Chicago, Ill.

Filed May 1, 1970, Ser. No. 33,988

Int. Cl. D21b *1/08, 1/32;* D21c *5/02*

U.S. Cl. 162—8 19 Claims

The reclamation of purified and reusable pulps from various types of waste papers by first shredding the paper into fine pieces, boiling the shredded paper in a chemical solution containing sodium hydroxide, sodium carbonate, sodium or ammonium phosphate and sodium borate, water washing the chemicals from the cooked paper and then bleaching the pulp with a chemical bleach at elevated temperature.

3,620,910

PROCESS FOR THE PREPARATION OF GROUNDWOOD PULP FROM A DICOTYLEDONOUS PLANT

Walter P. Lawrence, Hamilton, Ohio, assignor to U. S. Plywood-Champion Papers, Inc., New York, N.Y.

Filed June 23, 1969, Ser. No. 835,787

Int. Cl. D21c *3/02*

U.S. Cl. 162—83 7 Claims

There is disclosed a process for the preparation of groundwood or mechanical pulp from a dicot material such as kenaf. The process as applied to kenaf comprises treating chopped kenaf at about atmospheric pressure and ambient temperature with an aqueous solution of alkaline sulfite and sodium carbonate at a pH of from about 10 to 11 for about 1–30 minutes, and thereafter mechanically refining said material to form a pulp.

3,620,911

WET DEPITHING OF A NONWOODY LIGNOCELLULOSIC PLANT MATERIAL

Henrik J. Eklund, Pittsfield, Mass., and Alfred J. Seaquist, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed July 3, 1969, Ser. No. 839,067

Int. Cl. D21c *5/00*

U.S. Cl. 162—96 14 Claims

A method of preparing a paper pulp from a fibrous nonwoody lignocellulose plant material by first wetting said material, wet depithing said plant material by subjecting a slurry of the plant material to a shredding operation, further diluting the slurry of released pith and fiber, separating the pith from the fiber, dewatering the resultant fiber slurry, impregnating said fibers by addition of a base such as an alkali metal hydroxide solution, and chemically digesting the resultant liquor containing said fibers by cooking at a relatively high temperature and under pressure.

3,620,912

MERCERIZATION OF CELLULOSIC MATERIALS USING A SOLUTION CONTAINING A MERCERIZING CONCENTRATION OF ALKALI AND A BARIUM COMPOUND

Andrew Beelik, Shelton, and Jim D. Wilson, Olympia, both of Wash., assignors to International Telephone and Telegraph Corp., New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,340

Int. Cl. D21c *3/02*

U.S. Cl. 162—90 9 Claims

A minor amount of barium compound is incorporated in a mercerizing concentration of alkali to form a solution. A cellulosic material is treated with this solution to produce a high yield of mercerized product. This product contains a substantial amount of alkali-soluble, short-chain polysaccharides.

3,620,913

A PROCESS OF MAKING PAPER AND PAPER MADE THEREFROM USING STARCH ANTHRANILATE

Stanley Marshall Parmerter, Wheaton, Ill., assignor to CPC International Inc., Englewood, Calif.

Continuation-in-part of application Ser. No. 676,614, Oct. 19, 1967, now abandoned. This application Mar. 3, 1970, Ser. No. 16,245

Int. Cl. D21b *3/28*

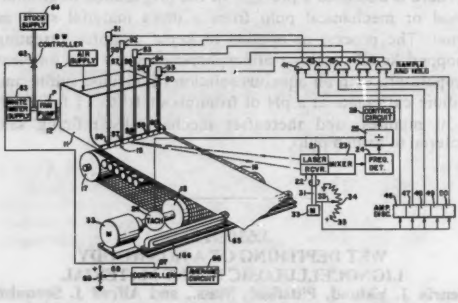
U.S. Cl. 162—175 8 Claims

A method of improving the properties of treated paper by addition of starch anthranilate to paper pulp and paper made therefrom. More particularly, the invention covers the use of starch anthranilate in improving the retention of inorganic filler and fiber fines in the processing of paper. Various other properties of the formed paper article are also improved such as dry strength and tensile strength.

3,620,914
HEADBOX JET VELOCITY MEASURING SYSTEM AND METHOD

Antoni A. Rocheleau, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Apr. 28, 1967, Ser. No. 634,566
Int. Cl. D21f *11/02*
U.S. Cl. 162—198 17 Claims

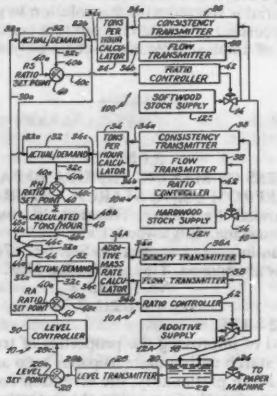


Disclosed is a system for measuring the velocity of a jet emerging from a headbox in a paper manufacturing system. Jet velocity is determined by measuring the Doppler shift frequency caused by the jet on a laser beam of coherent electromagnetic energy. The velocity of the jet is compared with the velocity of a Fourdrinier wire which receives the jet, whereby there is derived a signal for enabling a predetermined relative velocity between the jet and the wire to be automatically or manually maintained. The laser beam is scanned across the width of the jet to determine differences in the jet velocity as a function of width. Consistency of paper sheet basis weight is maintained by controlling the fiber liquid ratio of the mixture fed to the headbox in response to nuclear gauge measurements of the sheet.

3,620,915
FIBROUS STOCK BLENDING CONTROL SYSTEM

Marion A. Keyes, IV, South Beloit, Ill.; John A. Gudaz, Beloit, Wis., and Yuan-Hao Tsing, Austin, Tex., assignors to Beloit Corporation, Beloit, Wis.

Filed Dec. 19, 1968, Ser. No. 785,307
Int. Cl. D21f *1/08*; G05d *11/00*
U.S. Cl. 162—253 15 Claims

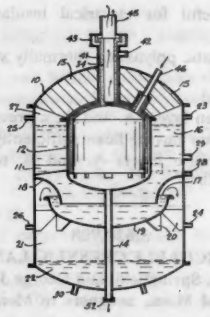


A system for controlling the composition of furnish in a papermaking mixing tank wherein a plurality of stocks are blended. A level transmitter generates a signal indicating the level of furnish in the mixing tank. This signal is compared in a comparator with a set point for the furnish level, any difference therebetween being indicative of a demand signal. The consistency and flow of each stock are measured at a stock valve connecting the respective stock supply with the mixing tank. A tons-per-hour calculator utilizes the consistency and stock flow measurements to derive a signal which is then ratioed with the demand signal. This ratio is then compared with a ratio set point, the difference therebetween controlling the stock valve. Additives may be controlled as above. Alternatively, density and flow of additive supply are utilized in an additive mass rate calculator to derive a mass rate signal which is ratioed with the total amount of fiber stock, this ratio then being compared with an additive ratio set point to provide an additive control signal.

3,620,916
BED NUCLEAR REACTOR

John W. Hilborn, Chalk River, Ontario; Colin G. Lennox, Pinawa, Manitoba, and Wilson G. Mathers, Pinawa, Manitoba, all of Canada assignors to United States Atomic Energy Commission under the provision of 42 U.S.C. 2182

Filed Apr. 21, 1969, Ser. No. 817,955
Int. Cl. G21c *1/16, 19/02*
U.S. Cl. 176—32 4 Claims



A cavity-type reactor moderated by a heavy water reflector-moderator in an outer shell. The reactor is contained in a core shell which is fitted with a hollow inverted liner spaced from the core shell to form an annular passageway down which incoming feed water is passed. Fuel inside the liner generates steam that passes out through the top of the shells.

3,620,917
METHOD OF OPERATING A RADIOISOTOPE RADIATION SOURCE

Robert Flaherty, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 7, 1969, Ser. No. 874,749
Int. Cl. G21c *19/00*
U.S. Cl. 176—39 4 Claims

A method for conserving radioisotopic fuel such as cobalt-60 comprising initially loading a radiation source with a plurality of fuel elements wherein the outputs of the elements are of a decreasing succession with each element decaying to the original power output of a succeeding element in a uniform time interval. After each uniform time interval the least powerful element is replaced with an element having the same output as the original most powerful element. The replaced element is reprocessed by separating the decay products such as nickel-60 from the radioisotopic fuel.

3,620,918

METHOD FOR THE BIOCHEMICAL ISOLATION OF 1-MENTHOL

Tatsuo Moroe, Tokyo; Satohiko Hattori, Kanagawa; Akira Komatsu, Tokyo, and Yuzo Yamaguchi, Kanagawa, all of Japan, assignors to Takasago Perfumery Co. Ltd., Tokyo, Japan

Filed Nov. 21, 1969, Ser. No. 878,913
Claims priority, application Japan, Nov. 22, 1968, 43/85227
Int. Cl. C12b *1/00*
U.S. Cl. 195—2 7 Claims

Method for the biochemical isolation of l-menthol. Specifically, an improved method for the optical resolution of racemic menthol utilizing an enzyme, carboxylic ester hydrolase, which is produced by micro-organism belonging to the class of Candida, Saccharomyces, Hansenula, Rhodotorula, Torulopsis, Schizosaccharomyces, Pichia, Sporobolomyces, Debaryomyces, Nadsonia, Trichosporon, Brettanomyces, and Cryptococcus.

The l-menthol may be utilized in perfumes, medicines, etc.

3,620,919

EXTRACTION OF STEROIDAL MATERIALS FROM VEGETABLE MATERIALS

Roland Hardman, Bradford-on-Avon, England, assignor to National Research Development Corporation, London, England

Filed Aug. 12, 1968, Ser. No. 751,760
Claims priority, application Great Britain, Aug. 30, 1967, 39,765/67
Int. Cl. C12b *1/00*
U.S. Cl. 195—7 23 Claims

The yield of recoverable steroidal saponins and sapogenins from steroidal sapogenin affording vegetable materials is increased by treating the vegetable material with a regulator prior to recovery of the steroidal material. The regulator is a substance capable of modifying normal plant metabolism or normal plant growth characteristics and the chemically diverse regulators are selected from naturally occurring and synthetic plant growth regulators including auxins, hormones and herbicides, sulphydryl inhibitors, regulators of steroid metabolism or lipid metabolism, naturally occurring and racemic α-amino acids, vitamins of the B group, rutin and water-soluble derivatives of vitamin A and tocopherol, growth factor analogues including vitamin and amino acid antimetabolites and penicillin, griseofulvin and chloramphenicol antibiotics. Diosgenin is recovered from species of *Dioscorea*, *Trigonella* and *Balanites* by incubating the vegetable material with regulator in an aqueous medium for up to 72 hours, hydrolyzing the incubated product with hydrochloric acid and solvent extracting sapogenins from the hydrolysate. Yields are further increased by also adding steroid precursors or C_{10} to C_{36} saturated hydrocarbons during incubation.

3,620,920

PROCESS FOR THE MANUFACTURE OF PHYSIOLOGICALLY ACTIVE COMPOUNDS

Giancarlo Lancini, Pavia, and Piero Sensi, Milan, both of Italy, assignors to Lepetit S.p.A., Milan, Italy

Filed May 15, 1967, Ser. No. 638,584
Claims priority, application Great Britain, May 18, 1966, 22,168/66
Int. Cl. C12d *9/00*
U.S. Cl. 195—28 6 Claims

Producing 2-nitroimidazoles, such as azomycin, by oxidizing the corresponding 2-aminomidazole with Streptomyces eurocidicus var. nitroxydans.

3,620,921

PROCESS FOR PRODUCING 5'-INOSINIC ACID AND 5'-GUANYLIC ACID NUCLEOTIDES

Shigeo Abe, Tokyo; Akira Furuya, Machida-shi, and Ryo Okachi, Machida-shi, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1968, Ser. No. 713,320
Claims priority, application Japan, Mar. 18, 1967, 42/16628
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 15 Claims

A process for simultaneously producing 5'-inosinic acid and 5'-guanylic acid nucleotides such as 5'-guanosine-monophosphate, 5'-guanosine-diphosphate and 5'-guanosine-triphosphate by fermentation which comprises culturing mutant strains of micro-organisms having suitable properties under aerobic conditions in an aqueous nutrient medium containing 5'-xanthylic acid. The products are useful, for example, as flavoring agents.

3,620,922

PROCESS FOR PRODUCING INOSINE

Shigeo Abe, Tokyo, and Akira Furuya, Machida-shi, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1968, Ser. No. 777,892
Claims priority, application Japan, Dec. 28, 1967, 42/83658
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 N 4 Claims

A process for producing inosine by fermentation which comprises culturing a biotin-requiring strain of Brevibacterium ammoniagenes or Corynebacterium glutamicum under aerobic conditions in an aqueous nutrient medium. Strains advantageously employed are Brevibacterium ammoniagenes ATCC 21295 and Corynebacterium glutamicum ATCC 21296.

3,620,923

URATE OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF

Pierre Laboureur, Neuilly Seine; Marcel D. P. Brunaud, Paris, and Claude Langlois, Montrouge, all of France, assignors to Societe D'Etudes Et D'Applications Boichimiques Jouj-en-Josas, Yvelines and Etablissements Clin-Byla Paris: Ugine-Kuhlmann, Paris, France

Filed Mar. 25, 1968, Ser. No. 715,623
Claims priority, application France, Mar. 29, 1967, Mar. 29, 1967, 100,672, 100673
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R 13 Claims

The invention relates to a new enzyme or urate oxidase which is very active in promoting oxidation of uric acid to allantoin. The urate oxidase is produced by fermentation under aerobic conditions of nutrient media containing sources of assimilable carbon, assimilable nitrogen and uric acid which have been seeded with suitable cultures of bacteria, fungi or yeasts. Isolation and purification of the urate oxidase is described.

3,620,924

PRODUCTION OF ACID-ACTIVE LACTASE

Muerner S. Harvey, Kowloon, Hong Kong, and Frederick W. Viebrock, Staten Island, N.Y., assignors to Baxter Laboratories Inc., Morton Grove, Ill.

Filed Apr. 1, 1969, Ser. No. 812,347
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 R 16 Claims

The production of an acid-active, acid-stable lactase enzyme preparation by cultivating *Aspergillus Niger* under aerobic fermentation conditions, extracting the growth product with water, adsorbing the extract with a hydrated aluminum silicate adsorbent at a pH of 3 to 6 and releasing an active lactase component therefrom by adjusting the pH to 7 to 8.

3,620,925

PROCESS FOR PURIFYING L-ASPARAGINASE

Kazuo Mochizuki, Sunto-gun, Shizuoka-ken; Hiroyasu Otsuka, Sunto-gun, Shizuoka-ken; Hideo Katumata, Gotenbe-shi; Tetuo Oka, Machida-shi, and Masao Tanaka, Machida-shi, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed June 20, 1969, Ser. No. 835,261
Claims priority, application Japan, June 24, 1968, 43/43396
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 A 15 Claims

The antitumor activity of L-asparaginase produced from the cultured cells of micro-organisms belonging to the genus

Serratia is retained by a purification process wherein, as one of the steps in the purification procedure, the enzymatic liquid is heated to a temperature of at least 60° C., preferably 60°–70° C., thereby denaturing and rendering ineffective the L-asparaginase-inactivating factors contained in the liquid. A more selective destruction of the inactivating factors can be obtained by adding L-asparagine to the enzymatic liquid.

3,620,926

PROCESS FOR THE ENRICHMENT OF L-ASPARAGINASE

Otto Wagner; Klaus Bauer; Wilfried Kaufmann; Erich Rauenbusch; Alfred Arens, and Eckart Irion, all of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 23, 1969, Ser. No. 887,755

Claims priority, application Germany, Dec. 24, 1968, P 18 16 900.1

Int. Cl. C07g *7/02*

U.S. Cl. 195—66 A **4 Claims**

L-asparaginase is obtained in concentrated purified form by fractional precipitation of an aqueous solution thereof with low molecular weight solvents, specifically diols of 4 to 8 carbon atoms, such as 2-methyl-pentane-diol-(2,4) and including such diols wherein one hydroxyl group is alkylated, for example 3-methoxybutanol.

3,620,927

CULTIVATION OF MICRO-ORGANISMS ON HYDROCARBONS

William W. Leathen, Wexford, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 645,470, June 12, 1967, now abandoned. This application June 26, 1969, Ser. No. 836,945

Int. Cl. C12c *1/00*

U.S. Cl. 195—82 **13 Claims**

Protein concentrates are obtained in a process which includes:

1. Cultivating a hydrocarbon-consuming micro-organism in the presence of an aqueous nutrient medium, a hydrocarbon and a gas containing free oxygen;
2. recovering from "1." a micro-organism containing a small amount of hydrocarbon as a contaminant;
3. contacting the hydrocarbon-contaminated micro-organism from "2." at a temperature below that which supports active fermentation of the micro-organism with an aqueous nutrient medium and a gas containing free oxygen in the absence of added hydrocarbon; and
4. recovering from "3." a micro-organism substantially free from contaminating hydrocarbon, the micro-organism thus recovered having a higher protein content that that of the hydrocarbon-contaminated micro-organims.

3,620,928

METHOD OF SEPARATING ISOMERS OF MONONITROTOLUENE

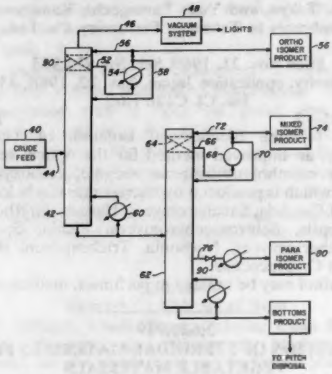
Constantine D. Miserlis, Arlington, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Filed July 13, 1970, Ser. No. 54,207

Int. Cl. B01d *3/34, 3/00;* **C07c** *79/10*

U.S. Cl. 203—6 **11 Claims**

A method of separating isomers of mononitrotoluene by fractional distillation without need for crystallization equipment. Two embodiments are described, one using a single distillating column that is operated in a two-pass blocked out fashion, and the other using two series-connected distillation columns.



3,620,929

PROCESS FOR SEPARATING ORTHO-ISOMERS FROM TOLYENE DIISOCYANATE MIXTURES

Ehrenfried H. Kober, Hamden, and Wilhelm J. Schnabel, Branford, both of Conn., assignors to Olin Corporation

Filed Oct. 31, 1968, Ser. No. 772,417

Int. Cl. B01d *3/34;* **C07c** *119/04*

U.S. Cl. 203—38 **5 Claims**

Removal of ortho-isomers from tolylene diisocyanate mixtures is effected by reacting said mixtures with a primary aromatic amine and subsequently distilling to recover nonvicinal tolylene diisocyanate.

3,620,930

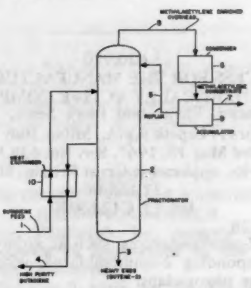
REMOVAL OF METHYL ACETYLENE FROM BUTADIENE

Lloyd D. Tschopp, Humble, and Rudolph C. Woerner, Houston, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Oct. 10, 1969, Ser. No. 865,272

Int. Cl. B01d *3/16*

U.S. Cl. 203—87 **5 Claims**



Methyl acetylene can be almost eliminated from a butadiene stream by fractionation and essentially all of the butadiene less the methyl acetylene recovered by carrying out the fractionation so that butadiene product stream is taken off the fractionator below the feed but above the bottom of the fractionator. The methyl acetylene is stripped out of the feed and concentrated in the upper portion of the fractionator and taken overhead in a butadiene stream from which it is separated, the butadiene stream being returned to fractionator in the methyl acetylene enriching portion of the

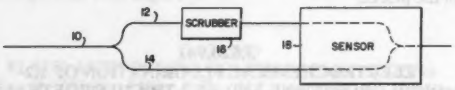
fractionator. A feed stream containing 90.11 mole percent butadiene, 0.0191 mole percent butene-1, 9.85 mole percent butene-2, 113 p.p.m. vinyl acetylene and 135 methyl acetylene can be fractionated to recover 99.5 percent of the feed as product with essentially the same component distribution except for methyl acetylene which is reduced to 1.23 p.p.m. This reduction in acetylene content improves the ultimate butadiene product for use in solution polymerizations to produce copolymer rubbers.

3,620,931

GAS ANALYSIS METHOD

Philip Reichner, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1968, Ser. No. 774,906
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T **7 Claims**



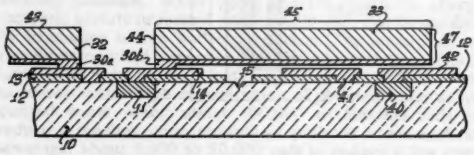
A method and apparatus for continuously measuring the proportion of one gas in a mixture of gases by selectively removing the one gas and thereafter measuring the partial pressure change in one or more of the remaining constituent gases brought about by removal of the one gas and thereby determining the proportion of the one gas in the original mixture.

3,620,932

BEAM LEADS AND METHOD OF FABRICATION

Joan M. Crishal, Torrance, and Edward J. Rice, Los Angeles, both of Calif., assignors to TRW Semiconductors Inc., Lawndale, Calif.

Filed May 5, 1969, Ser. No. 821,867
Int. Cl. C23b *5/48*
U.S. Cl. 204—15 **19 Claims**



A beam lead for a semiconductor device and a method of fabricating the beam lead thereon. A semiconductor wafer is provided, a plurality of semiconductor devices being disposed thereon, with a line being scribed between the semiconductor devices. Element images are formed upon the devices by photolithographic techniques and a metal layer deposited on the wafer making contact with the metal contacts of the devices. Thick metal leads are deposited upon the metal layer and an etchant is used to isolate the beam leads after which all photosensitive material is stripped away.

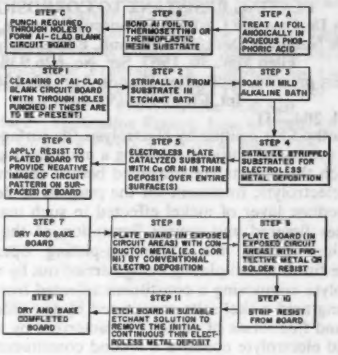
3,620,933

FORMING PLASTIC PARTS HAVING SURFACES RECEPTIVE TO ADHERENT COATINGS

John J. Grunwald, New Haven; Eugene D. D'Ottavio, Thomaston; Harold L. Rhodenizer, Bethlehem, and Michael S. Lombardo, Waterbury, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Filed Dec. 31, 1969, Ser. No. 889,472
Int. Cl. C23b *5/48;* **B44d** *1/18*
U.S. Cl. 204—15 **11 Claims**

Plastic parts are formed against an anodically treated aluminum surface by molding, laminating, etc., whereby the surface of the formed part after removal of or separation from the aluminum has a high-energy level and is receptive to adherent coatings of paint or metal plate. In particular, in addition to preparing plastic surfaces for acceptance and adhesion of paints, inks or the like, printed circuit boards and other metal-plated plastic substrates are prepared by first bonding anodically treated aluminum foil to a plastic substrate to provide a sacrificial cladding on the substrate, then stripping the aluminum chemically from the substrate, catalyzing the stripped surface and depositing a conductor metal plate thereon by electroless and/or electrolytic deposition, after application of a resist pattern of the desired circuit in the case of printed circuit boards.


STEP C
PUNCH REQUIRED THROUGH HOLES TO FORM Al-CLAD BLANK CIRCUIT BOARD
STEP B
BOND Al FOIL TO THERMOSETTING OR THERMOPLASTIC RESIN SUBSTRATE
STEP A
TREAT Al FOIL ANODICALLY IN AQUEOUS PHOSPHORIC ACID
STEP 1
CLEANING OF Al-CLAD BLANK CIRCUIT BOARD (WITH THROUGH HOLES PUNCHED IF THESE ARE TO BE PRESENT)
STEP 2
STRIPALL Al FROM SUBSTRATE IN ETCHANT BATH
STEP 3
SOAK IN MILD ALKALINE BATH
STEP 6
APPLY RESIST TO PLATED BOARD TO PROVIDE NEGATIVE IMAGE OF CIRCUIT PATTERN ON SURFACE(S) OF BOARD
STEP 5
ELECTROLESS PLATE CATALYZED SUBSTRATE WITH Cu OR Ni IN THIN DEPOSIT OVER ENTIRE SURFACE(S)
STEP 4
CATALYZE STRIPPED SUBSTRATE FOR ELECTROLESS METAL DEPOSITION
STEP 7
DRY AND BAKE BOARD
STEP 8
PLATE BOARD (IN EXPOSED CIRCUIT AREAS) WITH CONDUCTOR METAL (E.G. Cu OR Ni) BY CONVENTIONAL ELECTRO DEPOSITION
STEP 9
PLATE BOARD (IN EXPOSED CIRCUIT AREAS) WITH PROTECTIVE METAL OR SOLDER RESIST
STEP 12
DRY AND BAKE COMPLETED BOARD
STEP 11
ETCH BOARD IN SUITABLE ETCHANT SOLUTION TO REMOVE THE INITIAL CONTINUOUS THIN ELECTROLESS METAL DEPOSIT
STEP 10
STRIP RESIST FROM BOARD

3,620,934

METHOD OF ELECTROLYTIC TINNING SHEET STEEL

Joseph Endle, Thionville, France, assignor to Societe A Responsabilite Limitee Centre de Recherches du Fer Blanc, Thionville, France

Filed July 19, 1967, Ser. No. 654,433
Claims priority, application France, Aug. 8, 1966, 72,432
Int. Cl. C23b *1/00*
U.S. Cl. 204—34 **12 Claims**

A method of electrolytic tinning sheet steel in which a sheet of steel is subjected to degreasing in an alkaline bath, pickling in an acid bath in which the sheet steel is polarized as the cathode, preliminary coating with metal, tinning in an acid bath and treating to obtain the fusion and cooling of the tin deposited on the sheet. The method makes it possible to produce tinplate that has a layer of $FeSn_2$ which is continuous by virtue of very dense seeding and which thus has improved corrosion resistance.

3,620,935

PROCESS OF BLACK CHROMIUM PLATING

Karl S. Willson, Cleveland, Ohio, assignor to Kewanee Oil Company, Bryn Mawr, Pa.

Continuation-in-part of application Ser. No. 610,035, Jan. 18, 1967, now abandoned. This application Nov. 24, 1969, Ser. No. 879,518
Int. Cl. C23f *17/00;* **C23b** *5/50, 5/06*
U.S. Cl. 204—38 B **20 Claims**

The process and the improved black chromium plating produced thereby comprising electroplating chromium from an aqueous bath containing hexavalent chromium, trivalent chromium and a lower aliphatic carboxylic acid such as acetic acid. The hexavalent chromium compound is present in a range equivalent to 150–425 grams per liter of chromic acid anhydride; the trivalent chromium is present in an amount 8–30 grams per liter; and the total carboxylic acid, in both acid and carboxylate form, is in the range of 170–350 grams per liter of acid. The electroplating is conducted at 60–85° F. and with a cathode current density of 75–1000 amperes per sq. ft. The trivalent chromium concentration given above not only permits reproducable lustrous black chromium plating but also greatly decreases the break-in period for the bath. A further addition of ferric ions of up to 25 grams

per liter further decreases or completely eliminates the break-in period and also increases the maximum operating temperature of the plating bath to 105° F. When iron is utilized, the combined concentration of trivalent chromium and iron should not exceed 35 grams per liter.

3,620,936

ELECTROPLATING A DECORATIVE CHROMIUM-PLATING RESISTANT TO CORROSION

Gaetan De Coye De Castelet, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France

Filed Mar. 30, 1967, Ser. No. 626,938
Claims priority, application France, Apr. 13, 1966, 57477
Int. Cl. C23b *5/50, 5/08*
U.S. Cl. 204—41 **5 Claims**

A method for coating by electrolysis the surface of objects with a coating of chromium having a microfissured structure, in which the objects are subjected before chromium-plating to an electrolytic treatment for the purpose of depositing an intermediate layer of nickel effected in such manner that it becomes fissured and causes fissuration of the deposit of chromium during the chromium-plating operation, the crackle-finish nickel-plating being carried out by means of an electrolyte comprising a constituent selected from the group of strong acid nickel salts constituted by the chloride, sulfamate and fluoborate of nickel, characterized by the fact that the said electrolyte contains a second constituent formed by at least one alkaline salt of a strong acid.

3,620,937

METHOD AND ELECTROLYTE FOR ELECTROPLATING BRASS

John A. Lisowski, and Frank B. Lisowski, both of Newport, Mich., assignors to Natural Products Company, Newport, Mich.

Filed Aug. 11, 1969, Ser. No. 849,157
Int. Cl. C23b *5/36, 5/46*
U.S. Cl. 204—44 **6 Claims**

An electrolyte and process for electrodeposition of brass from an aqueous alkaline cyanide bath containing zinc cyanide, copper cyanide and an additive of cyclohexanone resulting in a uniform color of deposit and elimination of streaks and nonuniformity in color.

3,620,938

METHOD FOR OBTAINING A BRIGHT ZINC COATING BY ELECTRODEPOSITION AND THE BATH USED THEREFOR

James A. Von Pless, North Syracuse, and Richard P. Cope, Jr., New City, both of N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Dec. 11, 1968, Ser. No. 783,100
Int. Cl. C23b *5/10, 5/46*
U.S. Cl. 204—55 **16 Claims**

A brightening composition and a process for electrodepositing of zinc is described herein. The brightening composition is the reaction product of an aromatic aldehyde and an amine of the formula H_2NR wherein R is a saturated aliphatic hydroxyl radical having from one to four carbon atoms. In particular, bright deposits are achieved when an amide or substituted amide is intermixed with the reaction product of the aromatic aldehyde and the amine.

3,620,939

COATING FOR MAGNESIUM AND ITS ALLOYS AND METHOD OF APPLYING

Ocke C. Fruchtnicht, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Mar. 17, 1969, Ser. No. 807,923
Int. Cl. C23b *9/06*
U.S. Cl. 204—56 M **12 Claims**

The surface of magnesium and its alloys is provided with a protective coating, both decorative and resistant to corrosion, when subjected to an ammonium bifluoride and an ammonium metavanadate aqueous solution which preferably contains in addition water-soluble organic compounds, water-soluble permanganate ions, or water-soluble nitrate ions. The coating is conveniently and efficiently applied to the metal which is the anode in the coating solution.

3,620,940

METHOD OF INDUCING POLARIZATION OF ACTIVE MAGNESIUM SURFACES

Reyburn Wick, Southampton, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed May 12, 1970, Ser. No. 36,665
Int. Cl. C23b *9/00, 5/48*
U.S. Cl. 204—56 M **8 Claims**

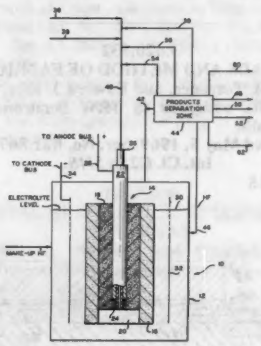
Methods for surface polarizing magnesium and its alloys; thus permitting large pieces to be readily anodized using only nominal electric power. Low adhesion, easily strippable film strips are adhered to the pieces, the strips providing areas of exposed metal which allow a high current density to be built up thereat which produces vigorous electrolytic action for progressively peeling off the films for subsequent anodization of the pieces.

3,620,941

ELECTROCHEMICAL FLUORINATION OF 1,2-DICHLOROETHANE AND 1,1,2-TRICHLOROETHANE

Forrest N. Ruehlen, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 24, 1970, Ser. No. 13,680
Int. Cl. B01k *3/00*
U.S. Cl. 204—59 **8 Claims**



In the electrochemical fluorination of 1,2-dichloroethane and 1,1,2-trichloroethane feedstocks, the selectivity to the products 1,2-dichlorotetrafluoroethane and 1,1,2-trichloro-1,2,2-trifluoroethane is increased by charging a mixture of said feedstocks to the electrochemical fluorination cell instead of charging said feedstocks to the cell separately.

3,620,942

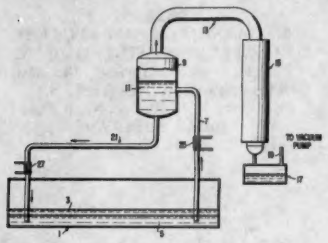
NATURAL CIRCULATION OF CATHODE METAL OF ELECTROLYTIC CELL

George G. Day, Maderia Beach, Fla., and Charles F. Bonilla, Tenafly, N.J., assignors to F. Barry Haskett, New York, N.Y.

Filed Mar. 19, 1969, Ser. No. 808,404
Int. Cl. C22d *3/06, 3/02*
U.S. Cl. 204—68 **7 Claims**

A natural circulation process for the removal of the product of electrolysis from a flowing molten metal cathode wherein such removal of the product of electrolysis is achieved through the flash vaporization of the metal of the electrolyte salt in a vacuum still with recirculation of the cathode metal to the electrolytic cell by gravity due to increased density associated with the vaporization of the metal of the electrolyte salt and the cooling of the cathode metal

from the flash vaporization. The process is particularly applicable to the separation of sodium from a lead-sodium



system, the sodium being separated containing approximately 0.1–1 percent lead impurity.

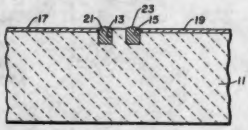
3,620,943
BLACK ANTIFOULING COATING COMPOSITIONS
John D. White, Little Falls, N.J., assignor to Celanese Coatings Company, New York, N.Y.
Filed May 26, 1969, Ser. No. 827,887
Int. Cl. C23f *13/00;* **B63b** *59/00*
U.S. Cl. 204—148 **8 Claims**

A method for preventing the growth of white calcareous deposits on black antifouling coated surfaces of marine vessels which are protected from corrosion by sacrificial metal anodes by applying to the surface a coating containing black iron oxide and copper compounds.

3,620,944
PROCESS OF PURIFYING WATER BY IRRADIATING IT
Keiko Tanito, Sakai-shi; Norio Kato, Sakai-shi; Shosaku Kinoshita, Sakai-shi; Masahiro Kinoshita, Asahi-ku, Osaka, and Tsuyoshi Sunada, Amagasaki-shi, all of Japan, assignors to Osaka Prefecture, Osaka, Japan
Filed Mar. 12, 1968, Ser. No. 712,386
Claims priority, application Japan, Sept. 9, 1967, 42/58071
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 **7 Claims**

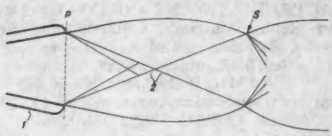
A process for purifying polluted water by irradiating it with ionizing radiation. Water polluted with parathion, phenyl mercuric acetate or methyl mercuric chloride can be purified by irradiating it with ionizing radiation. The amount of irradiations required depends upon the concentration of polluted water to be purified. It is required about 1,000,000 rads to reduce such a high concentration of polluted water as industrial waste water; about 100,000 to 500,000 rads to reduce a medium concentration of polluted water such as sewerage; about 5,000 to 50,000 rads to reduce a low concentration of polluted water such as drinking water.

3,620,945
METHODS OF MAKING A COMPOSITE DIELECTRIC BODY
David R. Sivertsen, Dallas; Olin B. Cecil, Richardson, and Rolf R. Haberecht, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 588,663, Sept. 29, 1966, abandoned.
Filed Jan. 19, 1970, Ser. No. 4,445
Int. Cl. B01j *1/10*
U.S. Cl. 204—157.1 H **9 Claims**



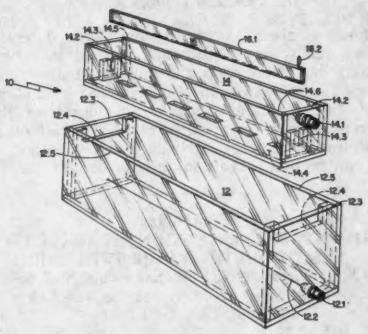
A method for altering the dielectric constant of a dielectric body by a bombarding of a region of the body with an electron beam for a sufficient length of time to alter the dielectric constant of the body. Exposure of the body to the electron beam is terminated before the region becomes conductive, and the dielectric body exposed to the beam is preferably monocrystalline in nature.

3,620,946
METHOD AND APPARATUS FOR CHEMICALLY TRANSFORMING GASES
Michel Denis, Marly le Roi, and Maurice Barillot, Verneuil en Halatte, both of France, assignors to Institut De Recherches De La Siderurgie Francaise, St. Germain en Laye and Societe Chimique Des Charbonnages, Paris, France
Filed June 4, 1969, Ser. No. 830,320
Claims priority, application France, June 6, 1968, 153,935
Int. Cl. C07b *29/06;* **C07c** *5/18;* **B01k** *1/00*
U.S. Cl. 204—171 **4 Claims**



In a system in which a gas in a supersonic stream is chemically transformed by a principal electric discharge, an auxiliary discharge first ionizes the gas in the stream.

3,620,947
ELECTROPHORETIC SYSTEM
Robert Carter Allen, and Dorothy J. Moore, both of Oak Ridge, Tenn., assignors to Ortec Incorporated, Oak Ridge, Tenn.
Filed Apr. 10, 1969, Ser. No. 815,145
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 G **6 Claims**

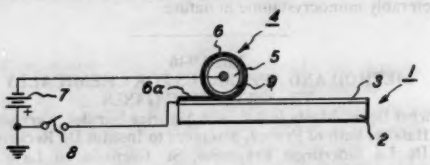


An electrophoretic system for concentrating and separating charged particles and for improving the resolution of the separated particle laminae that utilizes a buffer composition which will provide a ratio of leading-trailing ion boundary to the fastest particle mobility that approaches unity, during the period of free electrophoresis.

3,620,948
PHOTOELECTROPHORETIC IMAGING SYSTEM EMPLOYING PRELIMINARY ELECTROPHORETIC DISPOSITION OF THE IMAGING SUSPENSION
Arthur Walsh, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Oct. 3, 1968, Ser. No. 764,718
Int. Cl. G03g *13/22*
U.S. Cl. 204—181 **14 Claims**

An electrophoretic imaging process is disclosed whereby

an useable positive image may be directly produced from negative input. The light-sensitive imaging suspension is electrophoretically introduced into the electrode configuration prior to light exposure in the presence of an electric field.



3,620,949

METAL PRETREATMENT AND COATING PROCESS

Alexander Robley Morrison, Caulfield, and Heinz Dieter Herrmann, Boronia, both of Australia, assignors to Balm Paints Limited, Melbourne, Victoria, Australia

Filed Mar. 16, 1970, Ser. No. 20,016
Claims priority, application Australia, Apr. 11, 1969, 53380
Int. Cl. B01k *5/02*; **C23b** *13/00*
U.S. Cl. 204—181 **5 Claims**

A process of coating the surface of zinc-based metals with a paint film, to give a coating of high adhesion to the metal. The surface is successively drenched in an aqueous alkaline conditioning liquid, water rinsed, zinc phosphate 'conversion' coated and finally coated with a paint film by electrophoretic deposition. The conditioning liquid comprises a source of iron ions, an iron sequestering agent and sodium or potassium hydroxide, the pH of the liquid being at least 13.

3,620,950

ELECTROPHORETIC IMAGING EMPLOYING PERIODIC ELECTROMAGNETIC RADIATION

Carol K. Keller, Rochester, and Edward Forest, Penfield, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Oct. 3, 1968, Ser. No. 764,832
Int. Cl. C23b *13/00*; **G03g** */00*
U.S. Cl. 204—181 **10 Claims**

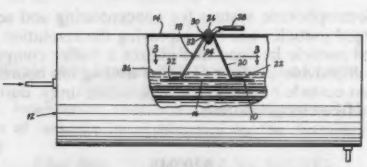
Method and apparatus for improving image density, contrast and quality and photographic speed in a photoelectrophoretic imaging system utilizing a particulate suspension for forming the image. In the preferred embodiment the method and apparatus stress a thin layer of the electrophoretic suspension of particles in a carrier on an electrode during imaging by applying a discontinuous illumination in conjunction with a constant or discontinuous field.

3,620,951

ADJUSTABLE SUSPENSION APPARATUS FOR ELECTROLYTIC WATER TREATMENT

Eugene S. Bremerman, 82 Whitehall Court, St. Louis, Mo.

Filed Sept. 19, 1968, Ser. No. 760,748
Int. Cl. C23f *13/00*
U.S. Cl. 204—196 **2 Claims**



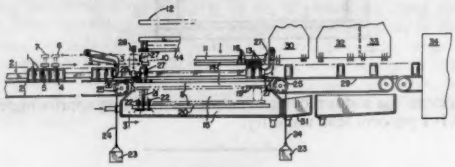
An easily installable and adjustable device for preventing electrolytic corrosion in boilers and other types of deleterious water action, including formation of scale and foaming. The device comprises a metallic iron grid, connected to two upstanding metallic arms provided with spaced regularly appearing perforations or holes. The ends of the arms are adapted to be bent over and broken off at the desired lengths and simply bolted through a brass bolt to the boiler shell, with provisions for connecting a ground cable to the bolt for grounding.

3,620,952

MECHANICAL APPARATUS FOR ELECTRODEPOSITION OF CANS

Wayne T. Chiappe, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed June 2, 1969, Ser. No. 829,411
Int. Cl. B65g *49/04*
U.S. Cl. 204—198 **10 Claims**



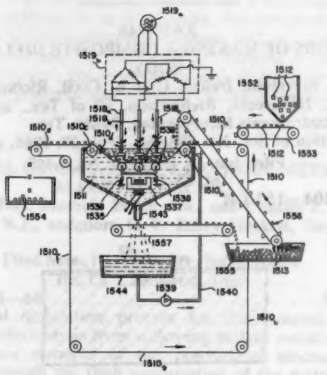
An automatic electrodeposition machine which electrodeposits a coating onto a metal can body. A number of batches of cans are moved in a series to a position above a coating solution bath and are lowered into the coating solution bath where coating is electrodeposited onto the cans. After electrodeposition has taken place, the coated cans are removed from the coating solution and are passed through an airblast which removes such of the coating solution as has adhered to the sides of the cans. The car bodies are then passed through a water rinse, then an airblast. The water rinse is made with deionized water because ordinary water leaves spots of material on the cans. Can bodies are now passed through any series of water rinses, airblasts, and the like, which may be deemed desirable in the circumstances, and finally, go into an oven. At the conclusion of these processes, a clean, coated can is obtained.

3,620,953

METHOD OF AND APPARATUS FOR THE DEBURRING OF WORKPIECES

Kiyoshi Inoue, 160 Sakato, Kawasaki, Kanagawa, Japan

Continuation-in-part of application Ser. No. 859,532, Apr. 21, 1969, now Patent No. 3,533,928, which is a continuation of application Ser. No. 598,391, Dec. 1, 1966, now abandoned. This application Mar. 19, 1968, Ser. No. 714,252
Claims, priority, application Japan, Oct. 17, 1967, Oct. 18, 1967, Oct. 20, 1967, Oct. 23, 1967, Oct. 24, 1967, Dec. 2, 1967, Dec. 20, 1967; 42/66788, 42/67045, 42/67630, 42/68166, 42/68123, 42/77243, 42/81711
Int. Cl. B01k *3/00*; **C23b** *3/00, 3/06*
U.S. Cl. 204—202 **13 Claims**



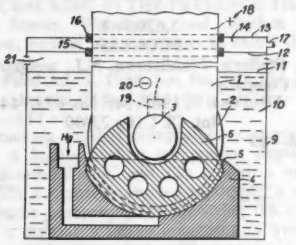
Apparatus for the electrochemical deburring of metallic workpieces in which a drum of endless band forms a continu-

ously displaceable surface for the workpieces which, together with carbon particles and/or other abrasive particles, are agitated in an electrolyte. The drum is rotated about its horizontal axis while a pair of disks form electrodes closing the drum. When the endless belt is used, it then passes into a vessel retaining the electrolyte and thereafter carrying the workpieces to a collecting trough while carbon particles are continuously added or removed from the system whose electrodes are connected in pair to respective phases of the power supply. A drum system may also have a perforated-wall drum or other means for enabling gases to be withdrawn from the system while a stationary vessel system may effect the agitation of the electrolyte by pulsed jets. A gas is injected into the electrolyte to distribute the electric current path more uniformly and dilute nascent gases produced by electrolysis.

3,620,954
ELECTROLYTIC CELLS

Karl Ziegler, and Wilhelm Eisenbach, both of Mulheim-Ruhr, Germany

Filed Oct. 11, 1968, Ser. No. 766,849
Claims priority, application Germany, Oct. 14, 1967, P 16 71 484.4
Int. Cl. B01k *3/00*; **C22d** *1/04*
U.S. Cl. 204—206 **24 Claims**

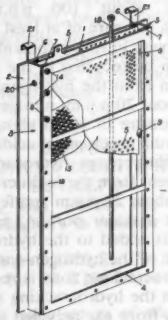


An electrolysis cell having rotating, disc-form cathodes immersed in an electrolyte. Sheet form anodes are disposed between the cathodes. Means are provided for advancing the anodes to compensate for dissolving of the anodes during electrolysis.

3,620,955
CATHODE CELL

Ivor Wynford Jones, Ilford, England, assignor to Carrier Engineering Company Limited, London, England

Filed May 16, 1969, Ser. No. 825,135
Int. Cl. C23g *5/74*; **B01k** *3/04, 3/10*
U.S. Cl. 204—283 **6 Claims**

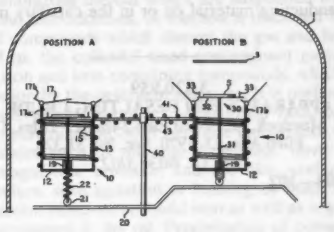


A cathodic cell for use in a paint electrode position process has a front wall constituted in part by a removable semipermeable membrane, backwall and sidewalls and a bottom, a cathode element, and locating means by which the cathode element can be selectively located in the cell in any one of a plurality of positions relative to the front wall.

3,620,956
MECHANISM FOR THIN FILM DEPOSITION

Roy C. Gauger, Rochester, N.Y., assignor to The Bendix Corporation

Filed July 15, 1969, Ser. No. 841,822
Int. Cl. C23c *11/00, 13/00*
U.S. Cl. 204—298 **14 Claims**

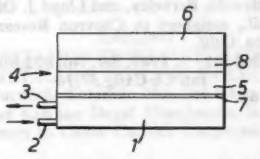


A method and apparatus for selectively depositing a thin film on less than all of a plurality of substrates within a vacuum chamber. The invention includes a plurality of substrate enclosures having heating and cooling means and doors which open and close to permit the deposition of a thin film upon the substrate. The enclosures are operated so that when one enclosure is open to allow material to be deposited upon a substrate, the other enclosure is closed to protect the substrate therein from unwanted deposits.

3,620,957
TARGETS FOR RADIO FREQUENCY SPUTTERING APPARATUS

John Arthur Alfred Emery, Crawley; Geoffrey Norman Jackson, Great Bookham, and Colin Richard Douglas Priestland, Horsham, all of England, assignors to Edwards High Vacuum International Limited, Crawley, England

Filed June 5, 1969, Ser. No. 830,813
Claims priority, application Great Britain, June 12, 1968, 27,932/68
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **3 Claims**



A target arrangement for use in radio frequency sputtering techniques in which a metal electrode has clamped to it a dielectric cover which carries target material to be sputtered.

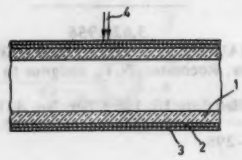
3,620,958
DEVICE FOR ELECTROPHORETIC ANALYSIS USING A CAPILLARY TUBE WITH DETECTION MEANS

Popko Reinder Dijksterhuis, and Robert Rust, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,974
Claims priority, application Netherlands, Sept. 30, 1968, 6813995
Int. Cl. B01k *5/00*; **B01d** *13/02*
U.S. Cl. 204—299 **15 Claims**

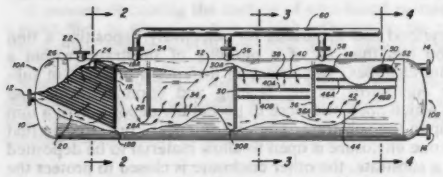
Cathode and anode containers are connected by a capilla-

ry measuring tube which has a detection electrode formed by



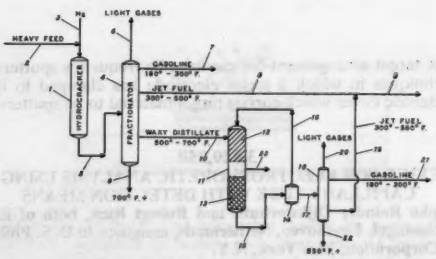
a photoconducting material on or in the capillary measuring tube.

3,620,959
APPARATUS FOR DESALTING CRUDE
Forrest L. Murdock, Sr., 2420 East 24th St., Tulsa, Okla.
Filed Apr. 23, 1970, Ser. No. 31,326
Int. Cl. B03c *5/02*
U.S. Cl. 204—302 **8 Claims**



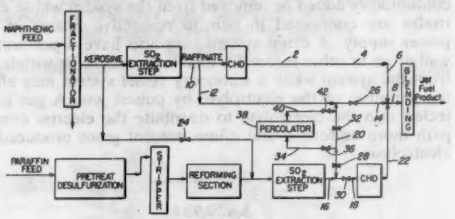
This invention relates to an apparatus for desalting crude. The invention is in the form of an elongated horizontal vessel having semiwall partitions therein dividing the vessel into a mixing chamber, a settling chamber, and includes means of introducing fresh water for mixing with and washing the crude in the mixing chamber, means of subjecting the crude to electric fields in the downflow and final treating chambers to augment the separation water from the crude, and means for separately passing the desalted crude out one outlet opening and water having salt extracted from the crude out another outlet opening.

3,620,960
CATALYTIC DEWAXING
Robert H. Kozlowski, Berkeley, and Lloyd J. Olson, Oakland, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed May 7, 1969, Ser. No. 822,607
Int. Cl. C10g *37/10*
U.S. Cl. 208—60 **7 Claims**



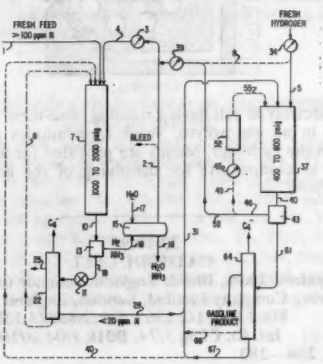
A waxy hydrocarbon oil feed is catalytically dewaxed in the presence of hydrogen at dewaxing conditions using a catalyst comprising molybdenum and combined fluorine, calculated as fluorine, in association with a porous solid carrier.

3,620,961
METHOD OF PRODUCING A JET FUEL
Henry R. Ireland, West Deptford Township, Gloucester County, N.J., assignor to Mobil Oil Corporation
Filed Feb. 5, 1969, Ser. No. 796,687
Int. Cl. C10l *1/04*
U.S. Cl. 208—79 **6 Claims**



Jet fuel having a low freeze point, e.g. -50° F., and high heat of combustion per gallon, e.g. at least about 124,000 B.t.u./gal., is produced by blending (1) a highly naphthenic jet fuel component having an advantageously very low freeze point but low heat of combustion on a pound basis with (2) a highly paraffinic jet fuel component having a high heat of combustion on a pound basis in excess of that desired in the blended product.

3,620,962
PROCESS
William C. Pfefferle, Middletown, N.J., assignor to Atlantic Richfield Company
Filed Oct. 9, 1967, Ser. No. 673,744
Int. Cl. C10g *23/00*
U.S. Cl. 208—89 **17 Claims**



A relatively high-boiling mineral oil having a nitrogen content of at least about 100 p.p.m. is catalytically hydrogenerated at a pressure of at least about 950 p.s.i.g. to give a product of lower nitrogen content. Hydrogen-containing effluent gas can be recycled to the hydrogenation zone. Liquid hydrocarbon from the hydrogenation zone and containing less than about 20 p.p.m. nitrogen is hydrocracked at a relatively low pressure of up to about 800 p.s.i.g. in the presence of a platinum group metal-acidic support catalyst to produce lower boiling range hydrocarbons. The nitrogen content of the effluent from the hydrocracking zone is maintained at less than about 20 p.p.m., preferably less than about 10 p.p.m. At least a major portion, preferably all, of the makeup hydrogen is added to the hydrocracking zone, and preferably a portion of the hydrogen-containing gas from the effluent of the hydrocracking zone is recycled to such zone. Nitrogen buildup in the hydrocracking zone is prevented by removing ammonia from gas recycled to the hydrocracking zone and/or by the use of hydrogen makeup gas in the hydrocracking zone. Any residual hydrocarbon from the hydrocracking zone recycled to the hydrogenation zone can also be controlled to prevent nitrogen buildup in the hydrocracking zone.

3,620,963

CATALYTIC DEWAXING

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 568,536, July 28, 1966, now abandoned , Continuation-in-part of application Ser. No. 645,855, June 8, 1967, now Patent No. 3,399,132, Continuation-in-part of application Ser. No. 742,321, July 3, 1968, now Patent No. 3,487,007, Continuation-in-part of application Ser. No. 774,207, Nov. 7, 1968, now Patent No. 3,520,829. This application Apr. 17, 1970, Ser. No. 29,700
Int. Cl. C10g *13/02*
U.S. Cl. 208—111 11 Claims

A process for catalytically dewaxing an oil which comprises contacting the oil at a temperature between 500° and 900° F., a pressure between 300 and 5,000 p.s.i.g., and in the presence of hydrogen, with a catalyst comprising a mixture of mordenite and an amorphous porous inorganic oxide associated with nickel and tin. Preferably the mixture of mordenite and the nickel-tin component is a physical mixture, i.e., preferably the nickel and tin are not supported on the mordenite, as by impregnation or ion-exchange into the mordenite. Preferably, the amorphous porous inorganic oxide associated with the nickel and tin is silica.

3,620,964

HYDROCRACKING CATALYST COMPOSITION, METHOD FOR MAKING THE SAME AND HYDROCRACKING IN THE PRESENCE THEREOF

William A. Stover, Woodbury, and Stephen M. Oleck, Moorestown, both of N.J., assignors to Mobil Oil Corporation

Filed July 9, 1968, Ser. No. 743,334
Int. Cl. C10g *13/02*; B01j *11/40*
U.S. Cl. 208—111 20 Claims

A hydrocracking catalyst composition comprising a mixture of (1) a hydrogenation component deposited on a crystalline aluminosilicate, and (2) a matrix material impregnated with a hydrogenation component, a method for making the same comprising impregnating the matrix component with a diphase medium consisting of hydrogenation metals present as finely divided precipitate in a salt solution, or a medium consisting of a solution of hydrogenation metals, and admixing the resultant wet mix with a component as defined in (1), and hydrocracking in the presence thereof.

3,620,965

EXPLOSIVE FRAGMENTATION OF POROUS SOLIDS

Edward J. Rosinski, Deptford, N.J., assignor to Mobil Oil Corporation

Filed May 28, 1969, Ser. No. 828,733
Int. Cl. C10g *11/02*
U.S. Cl. 208—120 5 Claims

Porous solids having surface area of at least 5 square meters per gram are reduced to smaller particle size by explosive fragmentation. Exemplary disclosure concerns aluminosilicate zeolites in extremely finely divided form prepared by detonation of crystalline zeolites having adsorbed therein explosive compounds and compositions. In one particular embodiment, finely divided zeolite catalyst is supplied to the reactants and energy is furnished to the system by detonation of explosive-loaded crystalline zeolites within the reaction mixture. In addition, the products of detonation may afford reactants.

3,620,966

METHOD HIGH SPACE VELOCITY HYDROGENATION OF OLEFINS

Stanley C. Haney, and Robert N., both of Cimbalo, Homewood, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,829
Int. Cl. C10g *23/04*
U.S. Cl. 208—143 10 Claims

A method for the manufacture of odorless paraffinic solvents having a high degree of saturation is disclosed. The method of the present invention involves contacting an olefinic hydrocarbon feedstock of solvent boiling range with hydrogen at high space velocities in the presence of a catalyst containing platinum or a platinum-type metal and alumina to produce a product having no more than 5 percent by volume olefinic unsaturation. The alumina component of the catalyst can be derived from a precursor hydrous alumina in which crystalline trihydrate predominates.

3,620,967

REREFINING OF WASTE CRANKCASE AND LIKE OILS

Graham L. Gulick, Chicago, Ill., assignor to Quvoe Chemical Industries, Schiller Park, Cook County, Ill.

Filed May 1, 1968, Ser. No. 725,940
Int. Cl. C10m *11/00*
U.S. Cl. 208—179 11 Claims

A method of treating waste crankcase and like oils to remove impurities therein which are suspended by high detergent and like additives. A method is disclosed for adding chemical compounds which disrupt the gas and liquid films adsorbed on the colloidal sized contaminant particles, particularly iron and iron-containing compounds, which are held in suspension by the detergent additives. It is preferred to use compounds which generate free hydroxyl radicals, such as hydrogen peroxide and other peroxide compounds, as well as metal halides such as aluminum chloride, ferric chloride, methyl magnesium bromide, and the like, preferably in a basic medium, with agitation or heating, or both, of the oil. The treatment removes colloidal iron as well as organometallic iron contained in the oil. Precipitation of components of the bottom sediment and water fraction of waste crankcase oil is followed by drawing off of the top layer of oil which may then be further treated, or which may be fed to a still for distillation and fractionation thereof.

3,620,968

DESULFURIZATION PROCESS EMPLOYING UPFLOW OIL AND HYDROGEN

Alan G. Bridge, El Cerrito; Joseph Jaffe, Berkeley, and David S. Mitchell, Fairfax, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1968, Ser. No. 772,365The portion of the term of the patent subsequent to Dec. 12, 1987, has been disclaimed.
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 1 Claim

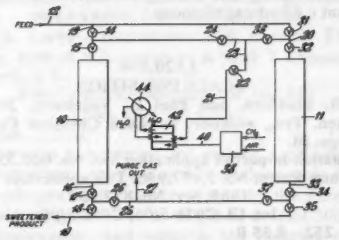
Hydrodesulfurization of a hydrocarbon oil feedstock is performed by passing the oil and hydrogen upwardly in cocurrent flow through at least one fixed bed of catalyst contained in a desulfurization reactor. The catalyst comprises pellets or other particles of alumina cogelled with a Group VI hydrogenating component, a Group VIII hydrogenating component, Group IV metal phosphate particles dispersed in said catalyst, and fluorine. The upflow oil and hydrogen operation with a cogel catalyst provides for higher activities and low initial fouling rates.

3,620,969

DESULFURIZATION BY SELECTIVE ADSORPTION WITH A CRYSTALLINE ZEOLITIC MOLECULAR SIEVE

Philip Hain Turnock, Katonah; Max Nai Yuen Lee, Yorktown Heights, and Krishan Dayal Manchanda, Scarsdale, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 15, 1969, Ser. No. 866,484
Int. Cl. C10g *25/04*
U.S. Cl. 208—245 3 Claims



Sulfur compounds are removed from liquid hydrocarbon streams by selective adsorption on zeolitic molecular sieves

and periodic desorption therefrom using a hot purge gas having a high water content. Regeneration of the adsorbent is carried out only to the degree that less than about 5 and more than about 2 weight percent water remains adsorbed on the zeolite.

3,620,970

REVERSE OSMOSIS MEMBRANES FROM HYDROXYALKYL DERIVATIVES OF CELLULOSE

Eugene D. Klug, Wilmington; Harold M. Spurlin, Cooper Farms, Wilmington, and William L. Young, III, Heritage Park, Wilmington, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Sept. 5, 1969, Ser. No. 855,727
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **18 Claims**

The invention provides reverse osmosis membranes characterized by a salt-rejecting layer of a hydroxyalkyl derivative of cellulose. The membranes are useful for desalination and other processes involving reverse osmosis.

3,620,971

BREAKING REFINERY SEWER OIL AND WATER EMULSIONS WITH SODIUM BICARBONATE

Oliver Plumbar, Port Arthur, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 21, 1970, Ser. No. 66,148
Int. Cl. C02c *5/02*
U.S. Cl. 210—59 **6 Claims**

Refinery sewer system emulsions containing oil, water and sediment are broken by the use of sodium bicarbonate.

3,620,972

METHOD OF AGGLOMERATING FINELY DIVIDED INORGANIC PHOSPHATES USING AN ORTHOPHOSPHATE AGGLOMERATING AID

Ellis Glenn Fite, Bronxville, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Mar. 12, 1968, Ser. No. 712,379
Int. Cl. B01j *2/28;* **C05b** *19/00*
U.S. Cl. 252—1 **17 Claims**

A method is provided for agglomerating finely divided substantially insoluble inorganic phosphate compositions in the presence of an alkali metal orthophosphate having a $M_2O:P_2O$ratio of from about 2:1 to about 3.21:1. M is an alkali metal having a molecular weight of from 20 to 41 inclusive. The material to be agglomerated is agitated and from about 5 to about 25 parts by weight water is added per 100 parts of material to be agglomerated. Agitation is continued until agglomeration is substantially complete and thereafter the agglomerated material is recovered. Additional embodiments include adding the water as steam, or as orthophosphate solutions.

3,620,973

DRILLING FLUID

Charles M. Harbordt, Bryan, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,719
Int. Cl. C10m *3/16, 3/14*
U.S. Cl. 252—8.5 C **8 Claims**

An aqueous drilling fluid dispersant and a method of drilling wells using said drilling fluid which contains as the dispersant a dihydroxyalkanone.

3,620,974

SCALE INHIBITION

James R. Stanford, and Paul G. Vogelsang, Jr., both of Houston, Tex., assignors to Nalco Chemical Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 600,354, Dec. 9, 1966, now Patent No. 3,477,956. This application Sept. 11, 1969, Ser. No. 857,239
Int. Cl. C02b *5/06;* **C09k** *3/00*
U.S. Cl. 252—8.55 B **17 Claims**

Phosphated hydroxy amines obtained by reacting polyphosphoric acid or phosphorus pentoxide with hydroxyamines, e.g., diethanolamine or triethanolamine, with or without neutralization, are used as scale inhibitors in brines, especially in oil wells, where calcium and barium salts are present.

3,620,975

MIXED COMPLEX ALUMINUM SOAP-CLAY GREASE COMPOSITION

Arthur T. Polishuk, Media, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed July 3, 1968, Ser. No. 742,155
Int. Cl. C10m *5/14*
U.S. Cl. 252—21 **3 Claims**

Grease having previously unachieved outstanding properties of high temperature and mechanical characteristics are prepared by the use of a mixed-base thickener of aluminum complex soap and cation-modified clay.

3,620,976

METHYL SILICONE GREASE COMPOSITION AND METHOD OF MAKING SAME

John H. Wright, Elnora, and Abraham L. Hajjar, Schenectady, both of N.Y., assignors to General Electric Company

Filed Sept. 16, 1968, Ser. No. 762,346
Int. Cl. C10m *7/50, 7/20*
U.S. Cl. 252—42.1 **4 Claims**

A grease composition contains a polysiloxane, the organic substituents of which are methyl radicals, a higher fatty acid soap of lithium, an amount of a polyether which is sufficient to cause the lithium soap of the fatty acid to disperse into the polysiloxane, but insufficient to deleteriously affect the high-temperature properties of the grease, and a sufficient amount of a base to render the grease alkaline. The grease is made by heating together the polysiloxane, the polyether, the lithium soap of the higher fatty acid and the base to a temperature of about 400° to 500° F., after which the grease composition is cooled to room temperature, then milled. The grease composition is used in the journal bearings of starter motors having high-current capacity and which run hot but are subjected to extremely low temperatures when not running.

3,620,977

REACTION PRODUCT OF ALKYLENE POLYAMINES AND CHLORINATED ALKENYL SUCCINIC ACID DERIVATIVES

Lewis R. Honnen, Petaluma, and Nicolaas Bakker, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 17, 1968, Ser. No. 784,462
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 A **13 Claims**

Compositions are obtained by halogenating an alkenyl succinic acid or acid derivative in a hydroxylic solvent and treating the resulting product under dehydrating conditions with an amine. The products with relatively long hydrocarbon chains find use as detergents in lubricating oils and as emulsifiers.

3,620,978

PROCESS FOR PREPARING STABLE POSITIVELY CHARGED ALUMINA-COATED SILICA SOLS

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 18, 1968, Ser. No. 745,715
Int. Cl. B01j *13/00;* **B44d** *1/18*
U.S. Cl. 252—313 **2 Claims**

Improved positively charged coated silica particles have been prepared by reacting boric acid stabilized basic aluminum acetate with a silica sol.

3,620,979

PROCESS OF FORMING FREE-FLOWING, PARTICULATE MIXTURES OF PHOSPHATES AND SILICATES

Duncan Simmons Corliss, Roselle, N.J.; Russell Raymond Keast, Yardley, and Saxman, Richard Lewis, Levittown, Pa., assignors to FMC Corporation, New York, N.Y.

Filed Apr. 24, 1968, Ser. No. 723,907
Int. Cl. C11d 17/06, 9/14
U.S. Cl. 252—385 8 Claims

Free-flowing, fast-dissolving, completely soluble, strong, granular particles containing a mixture of a hydratable alkali metal phosphate and an alkali metal silicate wherein the SiO_2 to said phosphate mole ratio is at least 1:1, were produced by maintaining the alkali metal phosphate at a temperature of 60° to 100° C., gradually adding an aqueous solution of alkali metal silicate to the alkali metal phosphate, continually evaporating water from the resulting mixture, controlling the rate of addition of the alkali metal silicate solution so that the resulting mixture is maintained in the form of discrete particles, continuing said alkali metal silicate addition until the discrete, granular particles have an SiO_2 to said phosphate mole ratio of at least 1:1, and recovering dry-appearing, granular particles which yield a pH of at least 10.5 in an aqueous 1 percent solution.

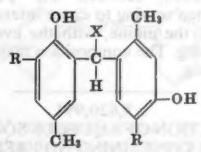
3,620,980

ASYMMETRICAL PHENOLIC NONDISCOLORING ANTIDEGRADANTS FOR POLYMERS

Evan Johnson Young, St. Albans, and Charles Gene Summers, Scott Depot, both of W. Va., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 609,335, Jan. 16, 1967, Pat. No. 3,505,287.
Filed Aug. 1, 1969, Ser. No. 871,106
Int. Cl. C08f 45/58
U.S. Cl. 252—404 2 Claims

Compounds of the formula



where R is secondary or tertiary alkyl and X is straight or branched chain primary, secondary, or tertiary alkyl, are excellent nondiscoloring antidegradants for rubber polymers. Mixtures containing isomers of these compounds are excellent nondiscoloring antidegradants.

3,620,981

HETEROGENEOUS CATALYST COMPOSITIONS

Eugene F. Magoon, Berkeley; Lawrence G. Cannell, Berkeley, and John H. Raley, Walnut Creek, all of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 11, 1967, Ser. No. 689,260
Int. Cl. B01j 11/84
U.S. Cl. 252—429 R 5 Claims

Catalyst compositions comprising certain hydrocarbon-transition metal halide complexes supported on an acidic, inorganic oxide support are useful in the oligomerization or polymerization of olefins.

3,620,982

PERFUME COMPOSITION CONTAINING DIHYDROISOCARYOPHYLLENE OXIDE

James D. Grossman, Old Bridge, N.J., assignor to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Sept. 18, 1968, Ser. No. 760,703
Int. Cl. A61p 7/00; C11b 9/00
U.S. Cl. 252—522 1 Claim

Dihydroisocaryophyllene epoxide and its use in perfume and fragrance compositions, and articles containing same.

3,620,983

-METHYLGLYCIDYL-ISOCYANURATES

Daniel Porret, Rinningen; Hans Batzer, Arlesheim; Rolf Schmid, Reinach, and Peter Ruf, Binningen, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed Nov. 12, 1969, Ser. No. 876,137
Claims priority, application Switzerland, Nov. 21, 1968, 17352/68
Int. Cl. C08q 30/02, 30/10
U.S. Cl. 260—2 EP 3 Claims

The new compound tri-(β-methylglycidyl)-isocyanurate is manufactured by a reaction, which is in itself known, of cyanuric acid with β-methylepichlorhydrin in the presence of tertiary amines or quaternary ammonium salts, and subsequent dehydrohalogenation with alkali. In comparison with the known tri-(glycidyl)-isocyanurate, tri-(β-methylglycidyl)-isocyanurate can be more easily processed, on the one hand because of the lower melting point and on the other hand because of the lesser reactivity. Apart from compression moulding compositions, the material is therefore also excellently suited to being used as a casting resin. Suitable curing agents are above all polysebacic anhydride, and also aliphatic polyamines. Using the latter, it is surprisingly possible to manufacture a stable B-stage which is for example suitable for the manufacture of compression moulding compositions.

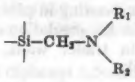
3,620,984

POLYURETHANE CATALYSTS

Manfred Dahm, Leverkusen; Hans Niederprum, Monheim, and Walter Simmler, Cologne-Muelheim, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of application Ser. No. 543,524, Apr. 19, 1966, now abandoned. This application June 25, 1968, Ser. No. 739,654
Int. Cl. C08g 22/44, 53/08
U.S. Cl. 260—2.5 AC 19 Claims

Polyurethane foams are prepared in the presence of a compound containing the grouping



wherein R_1 and R_2 are the same or different alkyl, cycloalkyl, alkoxyalkyl, alkenyl or aralkyl radicals or are members of a common cycloaliphatic or heterocyclic structure when the silicon atom is part of a silane or lower polysiloxane grouping; or R_1 has the above meaning and R_2 denotes an hydroxylalkyl or aminoalkyl group attached to the silicon atom through the oxygen or nitrogen atoms respectively. The invention contemplates complexes or mixtures of these compounds with organic metallic compounds also as catalysts. In addition new activator mixtures containing these catalysts are contemplated.

3,620,985

URETHANE FOAM CATALYST AND PROCESS FOR PREPARING URETHANE FOAM

William A. Larkin, Morristown, and Kenneth Treadwell, Rahway, both of N.J., assignors to M & T Chemicals Inc., New York, N.Y.

Filed Sept. 16, 1968, Ser. No. 762,318
Int. Cl. C08f 47/10
U.S. Cl. 260—2.5 AC 11 Claims

This invention is a process for making a cellular polyurethane comprising reacting a polyalkylene polyol having reactive hydrogen atoms as determined by the Zerewitinoff method exhibiting a molecular weight of at least 500, an organic polyisocyanate, and water in the presence of a gel catalyst and a foaming catalyst comprising an antimony compound, a base, and a nitrogen-containing organic compound.

3,620,986

SYNTHETIC RESINS COMPRISING REACTION PRODUCTS OF ISOCYANATES AND PROCESS FOR THEIR PRODUCTION

Hans Joachim Diehr; Rudolf Merten; Helmut Piechota, and Konrad Uhlig, all of Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 27, 1968, Ser. No. 787,565
Claims priority, application Germany, Jan. 2, 1968, P 17 20 768.0
Int. Cl. C08g *22/44, 53/10*
U.S. Cl. 260—2.5 AW 7 Claims

Synthetic resins which contain isocyanurate groups, especially foam materials are prepared by polymerization of compounds which contain more than one isocyanate group in the molecule in the presence of mononuclear Mannich bases of secondary amines, formaldehyde and phenols which Mannich bases are capable of incorporation in the polymer molecule and which contain, in addition to a substituted aminomethyl group and a phenolic OH group, at least one other group which contains hydrogen atoms which react with isocyanates.

3,620,987

PREPARATION OF POLYMER FOAM

Alexander M. McLaughlin, and James S. Rose, both of Guilford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 21, 1969, Ser. No. 878,875
Int. Cl. C08g *47/08;* C08j *1/14*
U.S. Cl. 260—2.5 N 14 Claims

High temperature resistant cellular polymers are prepared in a one-shot procedure by reacting a polycarboxylic acid or polycarboxylic anhydride with an organic polyisocyanate in the presence of a catalyst combination comprising a tertiary amine, an aliphatic alcohol (C_{1-6}), and optionally, a monomeric homocyclic polyepoxide. The use of the latter catalyst system not only increases the rate of foam formation but permits foam formation to be initiated at ambient temperature without the need to supply external heat to the reaction mixture before or after the reactants are brought together. This permits pouring-in-place of the foam forming system, for example, in the insulation of cavity walls for construction purposes, in trailer walls, and in cold storage frameworks and the like.

3,620,988

METHOD OF PREPARING BEAD-TYPE POLYMERS

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 31, 1968, Ser. No. 772,406
Int. Cl. C09j *3/02, 3/12;* C08d *9/06*
U.S. Cl. 260—17.4 12 Claims

There is disclosed a method wherein discrete droplets of liquid monomer containing a monomer-soluble free radical-type catalyst are suspended in an aqueous mucilage having plastic flow properties and at least a minimum critical yield value induced by a water-insoluble polymeric thickening dispersing agent such as a carboxyl-form or dual-salt forms of a cross-linked polyacrylic acid. The polymerization is carried out at the usual temperatures under substantially quiescent conditions whereby the droplets are not subjected to sufficient shear to deform or subdivide them. Salts of nitrobenzene sulfonic acids added to the aqueous phase further suppress new particle initiation therein, narrows the particle sized distribution, and produces clearer product suspensions. The products are obtained as permanent suspension of discrete beads usually of spherical shape and having great clarity, low water sensitivity and good electrical properties. The method is ideally adapted to the continuous mode of operation. The suspensions are permanent yet the aqueous phase is easily removed by screening or centrifuging thereby permitting both easy isolation of dry beads and, if desired, easy concentration of the suspension to very high polymer solids levels.

3,620,989

ALKYDS OF UNSATURATED DIBASIC ACIDS, POLYOLS, AND UNSATURATED FATTY ACID ESTERS AND METHOD FOR MAKING SAME: EMULSION COPOLYMERIZATION OF SAID ALKYDS WITH POLYMERIZABLE MONOMERS AND THE RESULTING POLYMERS

Lowell O. Cummings, San Anselmo, Calif., assignor to Pacific Vegetable Oil Corporation, San Francisco, Calif.

Filed Sept. 15, 1969, Ser. No. 858,125
Int. Cl. C09d *3/64*
U.S. Cl. 260—22 CB 26 Claims

A distinctive alkyd is made by reacting at a temperature below 350° F., an unsaturated dibasic acid or anhydride (e.g., maleic anhydride or fumaric acid) with an unsaturated fatty acid ester (e.g. safflower oil) that has been alcoholized with a polyol (e.g., ethylene glycol). This alkyd can then be emulsion copolymerized with various polymerizable monomers (e.g. vinyl acetate, styrene) to produce a high molecular weight polymer that is thermosetting and forms tough homogeneous films.

3,620,990

PROCESS FOR THE PRODUCTION OF FOAMED POLYANHYDRIDE COPOLYMERS AND PRODUCTS THEREOF

Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 12, 1968, Ser. No. 751,746
Int. Cl. C08c *7/08;* C08d *13/08;* C08f *47/10*
U.S. Cl. 260—2.5 R 13 Claims

A flowable composition is provided which is foamable, comprising a solution of

A. a polyanhydride copolymer of

1. a straight chain alpha-olefin having between three and about 20 carbon atoms, and

2. maleic anhydride

B. a liquid monoepoxide, and

C. maleic anhydride.

A curing agent such as a tertiary amine is used to initiate the exothermic reaction between the polyanhydride, the generated heat then serving to cause interaction of the maleic anhydride and the amine, with the evolution of gas and consequent foaming. The composition may be molded during foaming and curing.

3,620,991

PREPARATION OF AQUEOUS SOLUTION OF ACRYLAMIDE CONTAINING NO FREE OXYGEN AND POLYMERIZATION OF ACRYLAMIDE THEREIN

Richard Barkman Wasser, Rowayton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 25, 1968, Ser. No. 762,620
Int. Cl. C08f *1/00*
U.S. Cl. 260—29.6 Z 8 Claims

Dissolved molecular oxygen in aqueous solutions of acrylamide is inactivated without significant detriment to the acrylamide and to the solution as a polymerization medium, by adding a water-soluble metal sulfite and allowing the solution to stand at pH 4–8. If desired, excess sulfite can be decomposed without harm to the acrylamide by raising the pH of the solution above 8, and the acrylamide therein can be polymerized or copolymerized by conventional means.

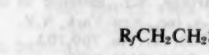
3,620,992

MONOBROMO SUBSTITUTED FLUORO-SILICONE POLYMERS

Yung Ki Kim, and Ogden R. Pierce, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 1, 1969, Ser. No. 846,959
Int. Cl. C08g *51/04, 31/02*
U.S. Cl. 260—37 SB 10 Claims

Organosiloxanes, containing



units, in which R_f is a monobromoperfluoroalkyl radical, are disclosed as nonflammable fluid lubricants and as nonflammable elastomers which have high-temperature stability.

3,620,993

COCONDENSATION RESIN OF FORMALDEHYDE, CYCLIC AMINOTRIAZINE AND ISOCYANURIC ACID

Ryoshiro Takano, Kamakura-shi; Kunihiko Ishii, Kamakura-shi, and Suezi Higo, Yokosuka-shi, all of Japan, assignors to Sinloihi Co., Konohana-ku, Osaka-shi, Japan

Filed Aug. 19, 1969, Ser. No. 851,448
Claims priority, application Japan, Aug. 30, 1968, 43/62161
Int. Cl. C08g 9/30, 51/04
U.S. Cl. 260—37 N 15 Claims

A colored finely powdered resin composition prepared by cocondensation of cyanuric acid, isocyanuric acid or derivatives thereof with a cyclic aminotriazine and formaldehyde is well tolerable to solvents and particularly suitable for printing ink, textile printing or dip dyeing by pigment and coloring plastics.

3,620,994

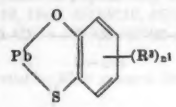
POLYVINYLCHLORIDE STABILIZATION WITH A LEAD SALT

Edward D. Weil, Hastings-On-Hudson, and Norman H. Gomlak, Tonawanda, both of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 638,683, Apr. 21, 1967, now abandoned. This application Oct. 29, 1969, Ser. No. 872,349
Int. Cl. C08f 45/14, 45/62
U.S. Cl. 260—41 9 Claims

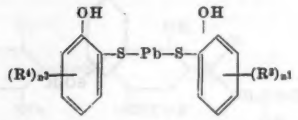
This invention relates to lead salts of mercaptophenol derivatives which have a stabilizing action on polyvinyl chloride, and which also impart a stable yellow coloration thereto, of which typical structural formulas are

(a)



and

(b)



in which R^3 and R^4 are organic groups, or substituted forms thereof, in which n^1 and n^3 are each zero to 4.

3,620,995

VINYL CHLORIDE HOMO- AND COPOLYMERS STABILITY

Laurence F. King, Mooretown, Lambton, Ontario, Canada, assignor to Esso Research and Engineering Company

Filed Mar. 5, 1969, Ser. No. 804,706
Int. Cl. C08f 45/58
U.S. Cl. 260—45.85 3 Claims

Homopolymers and copolymers of vinyl chloride with vinylidene chloride, vinyl acetate, propylene, acrylates and methacrylates are treated as a slurry with
a. a 0.1-10 percent solution of an alkaline, water-soluble hydroxide in order to remove undesirable side products of polymerization tending to degrade the polymer, and
b. a phenolic antioxidant such as a bis or tris phenol or a salt, thio- or carboxylic acid derivative thereof.

3,620,996

POLYESTER-AMIDE-IMIDE INSULATING VARNISH AND METHOD OF PREPARATION

Shigeru Matsumura, Hyogo; Nobuyuki Asano, Suita-shi, and Munetaka Kawaguchi, Nishinomiya-shi, all of Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed July 5, 1968, Ser. No. 742,545
Claims priority, application Japan, July 5, 1967, July 5, 1967; 42/43547, 42/43548
Int. Cl. C08g 20/30, 20/32
U.S. Cl. 260—47 CB 14 Claims

An insulating varnish comprising essentially a polyester-amide-imide obtained by condensating (1) a precondensation product prepared by reacting tricarboxylic acid anhydride and at least one isocyanate compound selected from the group consisting of a diisocyanate and polyisocyanate, solid precondensate having an amide linkage and an imide linkage in the molecular chain, and (2) at least one compound selected from the group consisting of terephthalic acid, isophthalic acid and lower dialkylesters thereof, di-ol and poly-ol, or (2) lower polymerization polyesters thereof.

3,620,997

QUINOXALINE-ANTHRAQUINONE POLYMERS

Carl S. Marvel, Tucson, Ariz., assignor to Research Corporation, New York, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,277
Int. Cl. C08g 15/02, 33/02
U.S. Cl. 260—50 5 Claims

Tetrachloroquinoxalines are condensed with 1,2,5,6-tetraaminoanthraquinone to produce polymers characterized by the presence of a quinoxaline nucleus and an anthraquinone nucleus in the repeating unit of the polymer. The polymers are useful in the preparation of heat-resistant articles intended for use at elevated temperatures.

3,620,998

DIIMIDAZOLE-ANTHRAQUINONE POLYMERS

Carl S. Marvel, Tucson, Ariz., assignor to Research Corporation, New York, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,276
Int. Cl. C08g 15/00, 33/02
U.S. Cl. 260—64 2 Claims

Terephthalaldehyde and isophthalaldehyde are condensed with 1,2,5,6-tetraaminoanthraquinone to produce polymers characterized by the presence of an anthraquinone moiety and two imidazole moieties in the repeating unit of the polymer. The polymers are useful in the preparation of heat-resistant articles intended for use at elevated temperatures.

3,620,999

ANTHRAQUINONE-BISBENZAZOLE POLYMERS

Carl S. Marvel, Tucson, Ariz., assignor to Research Corporation, New York, N.Y.

Filed Dec. 10, 1969, Ser. No. 884,013
Int. Cl. C08g 33/02
U.S. Cl. 260—65 3 Claims

The condensation of diphenyl 1,5-anthraquinone-dicarboxylate with diaminobenzidine, diaminobiphenol and dimercaptobenzidine yields bisbenzimidazole, bisbenzoxazole and bisbenzothiazole polymers, respectively. These polymers retain the quinone function of the anthraquinone reactant and can be solubilized by reduction to the hydroquinone form. Solutions containing the hydroquinone form can be wetspun into fibers, temperature-stable on oxidation back to the quinone form.

3,621,000

A PROCESS FOR THE PRODUCTION OF CROSS-LINKED ELASTOMERS FROM BLOCKED ISOCYANATE-CONTAINING PREPOLYMERS

Hans-Georg Schmelzer, New Martinsville, W. Va.; Hermann Gruber, Leverkusen; Eberhart Degener, Leverkusen, and Wilfried Zecher, Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 23, 1968, Ser. No. 786,427
Claims priority, application Germany, Jan. 2, 1968, P 16 94 237.3
Int. Cl. C08g 22/32
U.S. Cl. 260—77.5 AM 6 Claims

Cross-linked synthetic resins are prepared by heating to a temperature of from 60° to 180° C. a mixture of (A) a linear or branched polymerization or polycondensation product containing blocked isocyanate groups and (B) a bi- or polyfunctional ketimine or enamine. The cross-linked resins are useful as sheet structures, coverings, coatings, ceiling compositions, shaped articles and films of various types.

3,621,001

ACCELERATING ANIONIC POLYMERIZATION OF LACTAMS

Adolf Steinhofer, Ludwigshafen/Rhine; Helmut Doerfel, Ludwigshafen/Rhine; Georg Falkenstein, Ludwigshafen/Rhine; Wolfgang-Dieter Jeserich, Lambsheim/Pfalz, and Bernd Reichel, Frankenthal/Pfalz, all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Rhineland/Pfalz, Germany

Filed July 8, 1968, Ser. No. 743,053
Claims priority, application Germany, July 6, 1967, P 17 20 282.3
Int. Cl. C08g *20/18*
U.S. Cl. 260—78 L 4 Claims

A process for accelerating the base catalyzed polymerization of lactams carried out at temperatures of 80° to 200° C. using N,N'-disubstituted arylenedicarbamoyl lactams as activators.

3,621,002

TRANSPARENT FIBER-FORMING COPOLYAMIDES

James S. Ridgway, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 29, 1968, Ser. No. 780,280
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 6 Claims

Copolyamides are prepared by polymerizing adipic acid, hexamethylene diamine, 3-(4-carboxyphenyl)-1,1,3-trimethyl-5-indan carboxylic acid and 3-aminomethyl-3,5,5-trimethyl-1-cyclohexylamine. Filaments made from such copolyamides are useful in reinforcing rubber articles such as pneumatic tires.

3,621,003

THERMAL STABILIZATION OF POLYPIVALOLACTONE BY DEGASSING

Jan Selman, and Hendrik van der Vliet, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,916
Claims priority, application Great Britain, Aug. 26, 1968, 40,715/68 40/716
Int. Cl. C08g *17/017, 53/00*
U.S. Cl. 260—78.3 10 Claims

A polymer of a β-lactone is degassed by heating the polymer in the molten state at a temperature of at least 275° C. The process is applicable to polymers which have been prepared at temperatures below the polymer's melting point. An example of such a preparation is a slurry-polymerization of pivalolactone. The resulting degassed polymer can be molded, extruded or injected into articles, nibs or threads.

3,621,004

COPOLYMER OF AN ALKENE, AN ALKYL ESTER OF AN UNSATURATED CARBOXYLIC ACID AND A HYDROXYALKYL ESTER OF AN UNSATURATED CARBOXYLIC ACID

Rudolf J. A. Eckert, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Division of Ser. No. 721,092, Apr. 12, 1968, Pat. No. 3,518,197.
Filed Sept. 15, 1969, Ser. No. 870,777
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.75 4 Claims

Lubricating oil compositions containing a copolymer of (1) ethylene, (2) an alkyl ester of an unsaturated monocarboxylic acid and (3) a hydroxyalkyl ester of an unsaturated carboxylic acid exhibit excellent properties relative to thermal stability, viscosity index improvement and dispersant activity.

3,621,005

PPD-S (TUBERCULIN PROTEIN) COMBINED WITH GLUCURONIC ACID AND METHOD FOR PREPARING THE SAME

Morizo Ishidate, and Kenji Yusawa, both of Tokyo, Japan, assignors to Zaidan Hojin Tokyo Seikagaku, Kenayukai, Tokyo, Japan

Filed Aug. 19, 1968, Ser. No. 753,774
Claims priority, application Japan, Aug. 21, 1967, 45/53277
Int. Cl. A61k *27/14*; C07g *7/00*
U.S. Cl. 260—112 R 4 Claims

Tuberculin protein (hereinafter referred to as "PPD-S" in such a sense as a purified protein derivative) combined with glucuronic acid has less side effect and is chemically stable. The PPD-S combined with glucuronic acid is prepared by treating PPD-S with glucuronic acid metal salt, such as sodium glucuronate or potassium glucuronate, or with glucuronolactone.

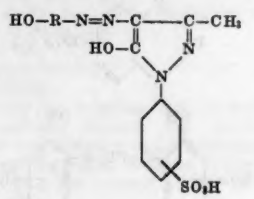
3,621,006

MIXED CHROMIUM MONOAZO DYE COMPLEXES

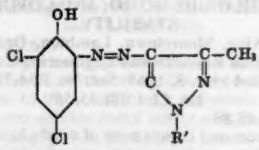
Marcel Georges Jirou, and Claude Marie Henri Emile Brouard, both of Sotteville-les-Rouen, France, assignors to Ugine Kuhlmann, Paris, France

Filed Feb. 20, 1968, Ser. No. 715,456
Claims priority, application France, Feb. 10, 1967, 94405
Int. Cl. C09b *45/16*; D06p *1/02*
U.S. Cl. 260—145 B 3 Claims

Mixed chromium complexes are provided of the type
(I)—Cr—(II)
wherein (I) represents the residue of a mono-azo dye of the general formula:



wherein R represents an o-arylene nucleus and (II) represents the residue of a mono-azo dye of the general formula:



wherein R' represents a benzene nucleus.
These complexes are suitable for coloring textile fibers.

3,621,007

WATER-INSOLUBLE THIADIAZOLE CONTAINING MONOAZO DYES

Erwin Hahn, Viernheim, and Hans Guenter Wippel, Ludwigshafen, both of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Sept. 18, 1969, Ser. No. 859,204
Claims priority, application Germany, Sept. 21, 1968, P 17 94 201.7
Int. Cl. C09b *29/08*; D06p *1/02*
U.S. Cl. 260—158 2 Claims

N,N-substituted para-aminomonoazo dyes having a 3-(β-carbalkoxyethyl)-mercapto-5-aminothiadiazole-(1,2,4) as

diazo component. They are useful for dyeing cellulose esters or synthetic linear polyesters.

3,621,008

DIRECT DISAZO AND TETRAAZO UREA DYES AND METHOD OF PREPARATION

John M. Ross, Wilmington, Del., and Harvey I. Stryker, Carneys Point, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 3, 1968, Ser. No. 764,936
Int. Cl. C09b 43/14; D21h 1/46
U.S. Cl. 260—175 8 Claims

Direct disazo and tetraazo urea dyes useful for dyeing cellulosic materials and consisting of salts of N,N'-bis-(sulfo- and carboxyarylazoaryl) ureas and salts of N,N'-bis(sulfo- and carboxyarylazoarylazoaryl) ureas, also known as bis(anilino)ketones, for example, bis[3-methyl-4-[(6,8-disulfo-2-naphthyl)azo]anilino] ketone, the cationic portions of said salts being at least 50 atom percent lithium and/or ammonium, and the remainder, sodium and/or potassium, a process for preparing said dyes, and stable aqueous solutions or suspensions of said dyes.

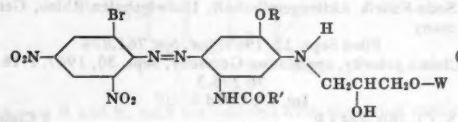
3,621,009

MIXTURES OF PHENYL-AZO-PHENYL DYESTUFFS

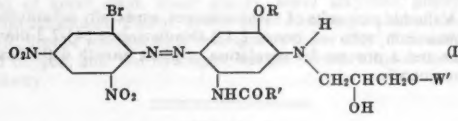
Nobujiro Ono, Tokyo; Hiroshi Hattori, Yokohama; Shoji Tada, Kasukabe-shi, and Tsunetoshi Kaida, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1968, Ser. No. 726,525
Claims priority, application Japan, May 10, 1967, 42/29113
May 10, 1967, 45/33110, 45/33111
Int. Cl. C07c 107/06; C09b 29/26
U.S. Cl. 260—207 3 Claims

A mixture of dyestuffs of the general formulas (I) and (II),



(I)



(II)

wherein R and R' are lower alkyl groups, W is a lower alkyl group and W' is a phenol group is disclosed. The respective components of the mixture are contained in an amount of more than 20 percent by weight. The mixture of dyestuffs has a particularly superior dyeing affinity to a polyester fiber.

3,621,010

6,6-DIFLUORO-17β-HYDROXY-17α-ETHYNYL-4-ESTREN-3-ONE AND 6,6-DIFLUORO-13β-ETHYL-17β-HYDROXY-17α-ETHYNYL-4-GONEN-3-ONE ETHYLENE KETALS

George Albert Boswell, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 720,493, Apr. 11, 1968, now Patent No. 3,511,861, Continuation-in-part of application Ser. No. 5,139, Jan. 22, 1970. This application Apr. 24, 1970, Ser. No. 31,763
Int. Cl. C07c 173/00
U.S. Cl. 260—239.55 3 Claims

6,6-Difluoro-17β-hydroxy-17α-ethynyl-4-estren-3-one ethylene ketal (6,6-difluoronorethindrone ethylene ketal), which can be obtained i.a. by a reaction of 6,6-difluoro-4-estren-3,17-dione 3-ethylene ketal with either ethynylmagnesium bromide or sodium acetylide, is an active progestational and antiuterotrophic agent. Its biological activity in rabbits and mice is comparable to that of norethindrone. Similarly, 6,6-difluoro-13β-ethyl-17β-hydroxy-17αethynyl-4-gonen-3-one ethylene ketal, obtained by reaction of the corresponding 3,17-dione 3-ethylene ketal with acetylene and lithium acetylide, is active.

3,621,011

6-(2-AMINO-HEXAHYDRO-2-INDANCARBOXYAMIDO) AND 6-(1,2,3,4,5,6,7,8,9,10-DECAHYDRONAPHTHALENE-2-AMINO-2-CARBOXAMIDO) PENICILLANIC ACIDS

Peter B. Russell, Villanova; Harvey E. Alburn, West Chester, and Norman H. Grant, Wynnewood, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,467
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 10 Claims

The compounds are 6-(2-amino-hexahydro-2-indancarboxamido) penicillanic acids and 6-(1,2,3,4,5,6,7,8,9,10-decahydronaphthalene-2-amino-2-carboxamido) pencillanic acids, which have broad spectrum antimicrobial activity against both gram-positive and gram-negative strains of bacteria, including penicillin-resistant staphylococci. The compounds are also characterized by being relatively acid-resistant, thereby to be effective on oral administration, and by low water solubility which makes them useful in repository injectable dosage forms without the necessity for forming salts thereof with organic bases.

3,621,012

OXIDATION OF LACTAMS TO CYCLIC IMIDES

Paul S. Starcher, Charleston; David Trecker, South Charleston, W. Va., and James E. McKeon, Thornwood, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 18, 1969, Ser. No. 851,082
Int. Cl. C07d 41/06
U.S. Cl. 260—239.3 R 11 Claims

Cyclic imides are produced by contacting lactams with a hydroperoxide in the presence of a metal salt catalyst. The starting material lactam must have an unsubstituted methylene position adjacent to the ring nitrogen in order for imidization to occur.

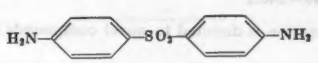
3,621,013

FORMAMIDINE COMPOUNDS OF DIPHENYL-SULFONE

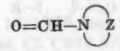
Erhardt Winkelmann, Kelkheim/Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius & Brunning, Frankfurt/Main, Germany

Filed Mar. 28, 1969, Ser. No. 811,642
Claims priority, application Germany, Apr. 9, 1968, P 17 70 162.1
Int. Cl. C07d 87/38
U.S. Cl. 260—239.6 4 Claims

Formamidine derivatives of diphenyl-sulfone which are effective medicaments against malaria are prepared by reacting 4,4'-diamino-diphenyl-sulfone of the formula



with N-formyl compounds of the formula



in which —N Z is a pyrrolidino, piperidino or morpholino radical, in the presence of acid halides and, if desired, converting the salts thus obtained into the free bases.

3,621,014

17 ,21-ORTHOCARBONATES OF STEROID DERIVATIVES

Ulrich Stache, Hofheim, Taunus; Werner Haede, Hofheim, Taunus; Werner Fritsch, Neuenhain, Taunus; Kurt Radscheit, Kelkheim, Taunus, and Hans-Georg Schroder, Hofheim, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt am Main, Germany

Filed Jan. 14, 1969, Ser. No. 791,185
Claims priority, application Germany, Jan. 18, 1968, P 16 68 079.8
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 5 Claims

The present invention relates to 17α,21-orthocarbonates of steroid derivatives.

3,621,015

PROCESS FOR THE MANUFACTURE OF (ANDROST-17β-Y1)-α-PYRONES

Werner Haede, Hofheim, Taunus; Werner Fritsch, Neuenhain, Taunus; Kurt Radscheit, Kelkheim, Taunus, and Ulrich Stache, Hofheim, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Feb. 3, 1969, Ser. No. 796,164
Claims priority, application Germany, Feb. 23, 1968, F 54 886
Int. Cl. C07c *169/64*
U.S. Cl. 260—239.57 9 Claims

The method of making androst-(17β-ay1)-α-pyrones having inotropic, cardiovascular, and diuretic activity by Wittig reaction of a 20-keto-21-acetal pregnene with a methyltriphenyl-phosphonium halide to form the corresponding 20-methylene compound, hydrolysis of the 21-acetal group, Michael addition of a malonic acid ester to the 20-methylene unsaturation, hydrolysis of the di-ester formed to the free di-acid, decarboxylation of one carboxy group, cyclization to a 17-enol-α-lactone with a carboxylic acid anhydride, and dehydrogenation to the corresponding α-pyrone; 3-β-hydroxy-21-oxo-23-carbomethoxy-Δ^5-cholenic acid; 3β-hydroxy-21-oxo-23-carboxy-Δ^5-cholenic acid; and 3β-hydroxy-21-oxo-Δ^5-cholenic acid, obtained as intermediates in such a method.

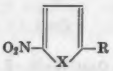
3,621,016

DIAGNOSTIC AIDS FOR USE IN THE DETECTION OF BACTERIA IN BIOLOGICAL AND OTHER FLUIDS

Herbert Berger, Sulzberg-Reid Allgnu, Near.; Otto Dold, Ilvesheim; Dietrich Kruger, Plankstadt/b, Schwetzingen; Kurt Stach, Mannheim; Felix Helmut Schmidt, Mannheim-Neuostheim, and Harald Stork, Lampertheim, Hessen, all of Germany, assignors to Boehringer Mannheim Gesellschaft mit beschrankter Haftung

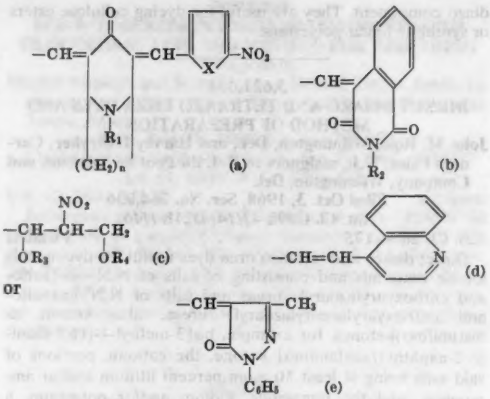
Division of Ser. No. 616,201, Feb. 15, 1967, Pat. No. 3,496,066.
Filed Dec. 26, 1968, Ser. No. 812,501
Int. Cl. C07d *5/30, 27/26, 29/00, 63/12*
U.S. Cl. 260—240.1 12 Claims

The invention is directed to novel compounds of the formula



(1)

where X is oxygen, sulfur or an alkylated nitrogen atom and R is



or

(e)

where R_1 is an aliphatic, aromatic, araliphatic, acyl, hydroxy, or acyloxy aliphatic radical. R_2 is hydrogen or lower alkyl, R_3 and R_4 are both hydrogen, or, together, an isopropylidene radical and n is 2 or 3; diagnostic agents containing said compounds for use in the detection of bacteria in biological and other fluids, and the process for detecting bacteria in such fluids using said agents which comprises incubating the fluid to be investigated in the presence of a nutrient medium and a compound as above set out, the number of bacteria being directly related to the color change thereafter observed.

3,621,017

SALTS OF THIADIAZINONES

Adolf Zeidler, Ludwigshafen/Rhine; Karl-Heinz Koenig, Ludwigshafen/Rhine; Adolf Fischer, Mutterstadt/Upper Palatinate, and Johann Jung, Limburgerhof/Upper Palatinate, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Sept. 23, 1968, Ser. No. 761,874
Claims priority, application Germany, Sept. 30, 1967, P 16 70 275.3
Int. Cl. C07d *93/30*
U.S. Cl. 260—243 R 1 Claim

Valuable new salts of thiadiazinones, especially substituted ammonium salts of benzo-2,1,3-thiadiazinone-(4)-2,2-dioxides and a process for regulation of plant growth with these compounds.

3,621,018

2,6-DIKETO-N-CARBOXYMETHYLMORPHOLINE

Raymond R. Hindersinn, Lewiston; George C. Hopkins, Clarence, and Charles S. Ilardo, Tonawanda, all of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed June 28, 1968, Ser. No. 740,853
Int. Cl. C07d *87/36*
U.S. Cl. 260—247.2 R 5 Claims

There is provided 2,6-diketo-N-carboxymethylmorpholine produced by a process which comprises contacting nitrilotriacetic acid in N,N-dialkyl acetamide with a dehydrating agent such as acetic anhydride and recovering the product. The compound is useful as an epoxy curing agent.

3,621,019

STEROID INTERMEDIATES

Upendra Kumar Pandit, Slichtstraat 41, Amsterdam, and Henderikus Obias Huisman, de Savornin Lohmanlaan 20, Amstelveen, both of Netherlands

Filed Sept. 3, 1969, Ser. No. 855,041
Int. Cl. C07d *87/32, 27/04*
U.S. Cl. 260—247.7 C 5 Claims

The total syntheses of steroids has become a reality and more recently has become commercially feasible. The present invention is an improvement on the currently em-

ployed techniques and involves the use of an enamine of the tetralone rather than the tetralone itself as a critical intermediate in the total synthesis. The advantage of the method is improved yields.

3,621,020

PROCESS FOR TRIMERIZING POLYISOCYANATES

Leo Ojakaar, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 676,617, Oct. 19, 1967, now abandoned. This application Dec. 17, 1969, Ser. No. 886,033

Int. Cl. C07d *55/38*

U.S. Cl. 260—248 NS 10 Claims

A rapid and economical method for trimerizing organic polyisocyanates by mixing an organic polyisocyanate with substituted guanidine and/or isobiguanide catalysts. The catalysts exhibit high activity, usually requiring little or no heat to induce trimerization. The trimerized polyisocyanates are especially useful in the preparation of rigid polyurethane foams.

3,621,021

QUINOXALINYL N⁴-OXIDE PHOSPHATES, METHODS OF PREPARATION AND USE OF SAME AS PESTICIDES

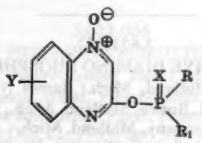
Bernard Miller, Plainsboro, and Jackson Pollard English, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 7, 1967, Ser. No. 658,598

Int. Cl. C07d *51/76*

U.S. Cl. 260—250 6 Claims

Novel quinoxalinyl N⁴-oxide phosphates together with their preparation and use for controlling insects and arachnids are disclosed. They have the formula:



wherein R and R_1 each are selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, phenyl, halo-substituted phenyl, lower alkyl-substituted phenyl, and NR_2 groups wherein R_2 is hydrogen or lower alkyl; X is sulfur or oxygen; and Y is hydrogen, halogen, lower alkyl or lower alkoxy.

3,621,022

ANTIBACTERIAL 5-NITROFURYL-PYRIMIDINES

Herbert Berger, Mannheim-Kafertal; Rudi Gall, Grossachsen; Hartmut, Merdes, Heidelberg; Kurt Stach, Mannheim-Waldhof; Wolfgang Voemel, Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

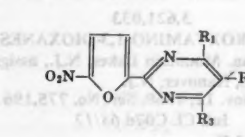
Filed Dec. 13, 1968, Ser. No. 783,715

Claims priority, application Germany, Jan. 20, 1968, P 16 70 307.4

Int. Cl. C07d *51/38*

U.S. Cl. 260—251 R 8 Claims

Novel 5-nitrofuran derivatives and the physiologically acceptable salts thereof having the formula:



wherein R_1 and R_2 each represent hydrogen, hydroxyl, lower alkyl, alkoxy, amino or acylamino, and R_3 is hydrogen, hydroxyl, lower alkoxy, amino or acylamino.

The 5-nitrofuran derivatives of the above formula constitute particularly effective antibacterial agents and are particularly useful in the treatment of urinary track infections.

3,621,023

1,3,2-OXAZABORINIDES AND METHOD FOR PREPARING THE SAME

Dhurairajan Padmanabhan, Highland Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 27, 1968, Ser. No. 732,045

Int. Cl. C07d *51/46*

U.S. Cl. 260—256.4 E 2 Claims

Condensed difluoro or diacetoxy 1,3,2-oxazaborinides are prepared by treating (a) a condensation product of a naphthostyril with an active ketomethylene compound, such as barbituric acid or its, N,N-dialkyl derivatives, an indandione, an oxindole or a pyrazolone, (b) a condensation product of an o-hydroxybenzaldehyde with an aromatic amine, or (c) an ortho-(beny-azol-2yl)-naphthol or phenol, the azole being oxazole, thiazole or imidazole, ortho-(benzazol-2yl)-naphthol either (1) boron trifluoride dissolved in ether, or (2) orthoboric acid, benzeneboronic acid or esters thereof, in acetic acid in the presence of acetic anhydride, at reflux. The difluoro and diacetoxy-1,3,2-oxazaborinides are characterized by affinity for polyesters when applied by disperse dyeing methods and fluoresce on the fiber. Similar effects are obtained on nylon and acetate and to some extent on modified polyacrylonitrile.

3,621,024

THERAPEUTICALLY EFFECTIVE CALCIUM DIOROTATE

Hans Alfred Nieper, Sedanstrasse 21, 3 Hanover, Germany

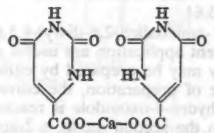
Filed Nov. 13, 1968, Ser. No. 775,539

Claims priority, application Great Britain, Nov. 15, 1967, 52,034/67

Int. Cl. C07d *51/30*

U.S. Cl. 260—256.4 1 Claim

The novel therapeutically valuable compound calcium diorotate, of the structural formula



and therapeutic compositions containing calcium diorotate.

3,621,025

IMIDAZO AND PYRIMIDO[2,1-b]QUINAZOLINE COMPOUNDS

Timothy Yu-Wen Jen, and Bernard Loev, both of Broomall, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Dec. 18, 1969, Ser. No. 886,370

Int. Cl. C07d *57/12*

U.S. Cl. 260—256.4 F 7 Claims

The compounds are tetrahydroimidazo (and pyrimido)-[2,1-b]quinazolines which have hypotensive activity and in addition have central nervous system depressant activity.

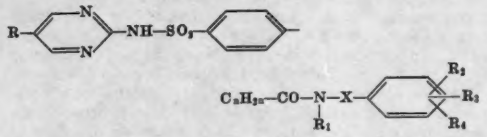
3,621,026

BLOOD-SUGAR-LOWERING SULFONYLAMINO PYRIMIDINES

Klaus Gutsche, and Eberhard Schroder, both of Berlin, Germany, assignors to Schering AG. of Berlin, Bergkamen and Berlin, Germany

Filed Dec. 19, 1968, Ser. No. 786,548
Claims priority, application Germany, Dec. 30, 1967, P 16 95 855.7
Int. Cl. C07d *51/36*
U.S. Cl. 260—256.5 R 13 Claims

Sulfonylamino pyrimidine derivatives of the formula



wherein R is lower alkyl, lower alkoxy, lower-alkoxy-lower-alkoxy, cycloalkyl or cycloalkoxy having five or six carbon atoms, or phenyl;
R_1 is hydrogen or lower alkyl;
R_2, R_3, and R_4 are members of the group consisting of hydrogen, lower alkyl, lower alkoxy, lower alkanoyl, lower alkanoyl-amino, trifluoromethyl, halogen, aminocarbonyl, benzyloxy, lower alkenyloxy, and phenyl;
n is 1 or 2; and
X is a carbon-to-carbon bond or CH_2,
and the salts of the derivatives with physiologically tolerated bases lower the blood sugar level in warm-blooded animals.

3,621,027

1-AMINOALKYL-2,6-DIARYL 4,5,6,7 TETRAHYDRO-4-OXINDALES

Karl Schoen, Kew Gardens, and Michael Finizio, Brooklyn, both of N.Y., assignors to Endo Laboratories Inc., Garden City, N.Y.

Filed Mar. 18, 1968, Ser. No. 714,067
Int. Cl. C07d *27/56*
U.S. Cl. 260—293.61 11 Claims

The novel 1-aminoalkyl-2,6-diaryl-4,5,6,7-tetrahydroindoles of the present application are useful as analgetics and antitussives. They may be prepared by either of two routes. In the first mode of preparation, the corresponding 2,6-diaryl-4,5,6,7-tetrahydro-4-oxoindole is reacted with aminoalkylating agent. In the second mode, a 2-aroylmethyl-6-aryl-1,3-cyclohexanedione is reacted with an appropriate diamine. In order to produce the compounds of this invention which are devoid of an oxo substituent at the 4 position, the 4-oxoindole produced as above is treated with an appropriate reducing agent.

3,621,028

CERTAIN Δ^2-THIAZOLINEALKANOIC ACIDS AND ESTERS

Robert Anthony Newberry, Bourne End, England, assignor to John Wyeth & Brother Limited, Taplow, Maidenhead, Berkshire, England

Filed Apr. 8, 1969, Ser. No. 814,444
Claims priority, application Great Britain, Apr. 9, 1968, 16,909/68
Int. Cl. C07d *11/24*
U.S. Cl. 260—306.7 10 Claims

This invention concerns 2-cycloalkyl or aryl-4-hydroxy-2-thiazoline-4 and 5-alkanoic acids which are pharmacologically efficacious as anti-inflammatory agents and which are useful as intermediates in the preparation of the corresponding thiazoles.

3,621,029

DERIVATIVES OF AMINOPENICILLANIC ACID

Peter Bamberg; Bertil Ake Ekstrom, and Berndt Olof Harald Sjoberg, all of Sodertalje, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

Continuation of Ser. No. 603,150, Dec. 20, 1966.
Filed July 15, 1969, Ser. No. 849,546
Int. Cl. C07d *99/14*
U.S. Cl. 260—306.7 10 Claims

Esters of 6-aminopencillanic acid as well as a method for their preparation are disclosed. The compounds are useful as intermediates in the preparation of penicillins.

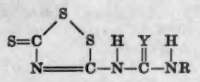
3,621,030

NEW UREIDO DERIVATIVES OF ISOPERTHIOCYANIC ACID AND THE METHOD FOR THEIR PREPARATION

Raymond Seltzer, New York, N.Y., assignor to M&T Chemicals Inc., New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,919
Int. Cl. C07d *91/70*
U.S. Cl. 260—306.8 R 2 Claims

This invention relates to heterocyclic compounds of the formula



wherein Y is selected from the group consisting of oxygen and sulfur and R is a hydrocarbon, said compounds being useful as peroxide inhibitors and corrosion inhibitors.

3,621,031

OPTICALLY ACTIVE DIAMINO PHOSPHINE SULFIDES

Henry Tolkmith, Midland, Mich.; James N. Seiber, Davis, Calif., and Paul B. Budde, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 604,153, Dec. 23, 1966, now abandoned. This application Oct. 22, 1969, Ser. No. 868,595
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 17 Claims

Optically active isomers of asymmetrical diamino phosphine sulfides containing a P-imidazolyl radical are resolved and separated.

3,621,032

TRICYCLIC POLYSULFUR COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Zaven S. Ariyan, Woodbury, Conn., and Robert L. Martin, Endicott, N.Y., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 6, 1969, Ser. No. 804,998
Int. Cl. C07d *77/00*; C08c *11/60*
U.S. Cl. 260—327 R 13 Claims

Novel polysulfur tricyclic compounds wherein two substituted aromatic rings are attached to each other through two tetrasulfide links.

3,621,033

5-HYDROXYAMINO-1,3-DIOXANES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed Nov. 12, 1968, Ser. No. 775,196
Int. Cl. C07d *63/12*
U.S. Cl. 260—332.3 H 5 Claims

This dislosure pertains to 5-hydroxyamino-2,5-disubstituted-1,3-dioxanes, e.g., 5-hydroxyamino-5-methyl-2-phenyl-1,3-dioxane. These compounds are useful as antifungal and antibacterial agents.

3,621,034

TETRAOXASPIRO(5,5)UNDECANES AND PROCESS FOR THE PREPARATION THEREOF

Wolfgang Fruhstorfer; Istvan Nameny; Wilhelm Baumer, and Bernd Dennler, all of Darmstadt, Germany, assignors to E. Merck A.G., Darmstadt, Germany

Filed Nov. 25, 1969, Ser. No. 879,923
Claims priority, application Germany, Dec. 7, 1968, P 18 13 316.9
Int. Cl. C07d 15/00
U.S. Cl. 260—340.7 20 Claims

Tetraoxaspiro(5,5)undecanes of the formula

wherein A is alkylene of 1–4 carbon atoms, X is O or S and R^1 is alkyl of 2–21 carbon atoms or $-(CH_2)_n-COOR^2$ in which n is 1–3 and R^2 is alkyl of up to 18 carbon atoms, which are stabilizers for polyolefins and other polymers, are produced by reacting pentaerythritol with an aldehyde of the formula $R^1-X-A-CHO$ or by reacting the corresponding bis-p,p'-alkenyl substituted or bis-p,p'-hydroxyalkyl substituted tetraoxaspirol(5,5)undecanes with a compound of the formula R^1-XH in which R^1, X and A have the values given above.

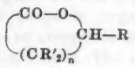
3,621,035

PROCESS FOR PREPARING SUBSTITUTED LACTONES

Andre Lakodey, Pierre-Benite; Henri Mathais, Ste-Foy les Lyon, and Francis Weiss, Pierre-Benite, all of France, assignors to Ugine Kuhlmann, Paris, France

Filed Oct. 22, 1969, Ser. No. 868,640
Claims priority, application France, Oct. 22, 1968, 170,806
Int. Cl. C07d 9/00, 7/06, 5/06
U.S. Cl. 260—343 8 Claims

A process for preparing substituted lactones having the formula:



wherein R is a linear or branched alkyl radical having one to 12 carbon atoms, a cycloaklyl radical having three to 12 carbon atoms, or a phenyl radical, R' represents a hydrogen atom or an alkyl radical having one to four carbon atoms, n is an integer number between two and 11, which comprises reacting a mixture of hydrogen peroxide and formic acid with a 1-substituted cycloalkene of the formula:

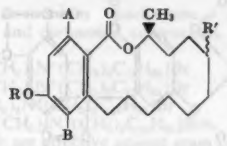
in which R has the same meaning as defined above.

3,621,036

DERIVATIVES OF ZEARALANE

Norman P. Jensen, Watchung, and Thomas B. Windholz, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 27, 1969, Ser. No. 803,048
Int. Cl. C07d 9/00
U.S. Cl. 260—343.2 F 17 Claims



wherein A is a member selected from the group consisting of hydrogen, hydroxy, and —OR; R is a member of the group consisting of hydrogen, lower alkyl, aralkyl, lower alkanoyl and benzol; B is a member of the group consisting of hydrogen and nitro, provided that B cannot be nitro when A is hydrogen; and R' is a member of the group consisting of $-CH_2OH$, —CHO, COOR'' and $-CH_2COOR$ wherein R'' is a member of the group consisting of hydrogen, lower alkyl and aralkyl, are administered orally and parenterally to animals in order to achieve an anabolic and estrogenic response such as increasing the growth rate of meat-producing animals.

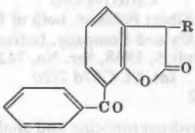
3,621,037

BENZOFURAN DERIVATIVES

Daniel Farge, Thiais; Claude Moutonnier, Paris, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc SA, Paris, France

Filed May 18, 1970, Ser. No. 38,595
Claims priority, application France, May 19, 1969, 6916092
Int. Cl. C07d 5/40
U.S. Cl. 260—343.3 3 Claims

The new benzofuran derivatives of the formula:



in which R represents hydrogen or an alkyl radical containing 1 through 4 carbon atoms, optionally carrying at least one halogen atom, possess pharmacodynamic properties making them useful as antiinflammatory agents.

3,621,038

DERIVATIVES OF 2-AZIDO-2-HYDROXY-1-NAPHTHALENEACETIC ACIDγ-LACTONES AND PREPARATION THEREOF

George Santroch, and Martin A. Davis, both of Montreal, Quebec, Canada, assignors to Ayerst, McKenna and Harrison, Limited, St. Laurent, Quebec, Canada

Filed Sept. 4, 1969, Ser. No. 855,408
Int. Cl. C07d 5/32
U.S. Cl. 260—343.3 5 Claims

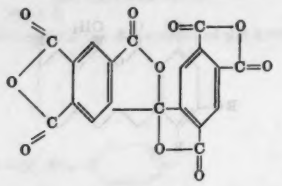
There disclosed herein 2-azido-1-carboxy-1,2,3,4-tetrahydro-2-hydroxy-7-methoxy-1-naphthaleneacetic acid γ-lactone methyl ester and 2-azido-1,2,3,4-tetrahydro-2-hydroxy-7-methoxy-1-methyl-1-naphthaleneacetic acid, γ-lactone. The compounds have antibacterial, antifungal, and trichomonicidal activities, and methods for their preparation and use are also disclosed.

3,621,039
BENZOPHENONEHEXACARBOXYLIC ACID-4,5,4',5'-DIANHYDRIDE-2,2'-DILACTONE

Helmut Muller, Lubecker Str. No. 8, Gladbeck, Germany

Filed Dec. 8, 1969, Ser. No. 883,293
Int. Cl. C07d 5/46
U.S. Cl. 260—343.3 1 Claim

Benzophenonehexacarboxylic acid-4,5,4',5'-dianhydride-2,2'-dilactone ($C_{19}H_4O_{10}$), having the formula:



This compound is made in one embodiment by the reaction of benzophenone 2,4,5,2',4',5'-hexacarboxylic acid with acetic anhydride.

Esters thereof with alkanols are useful as plasticizers for polyvinylchloride.

3,621,040
NEW SUBSTITUTED UREA DERIVATIVES

Andre R. Gagneux, Basel, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 783,411, Dec. 12, 1968. Continuation-in-part of Ser. No. 593,678 and 593,703, both of Nov. 14, 1966, abandoned. Filed Dec. 3, 1969, Ser. No. 882,381
Int. Cl. C07d 7/18
U.S. Cl. 260—345.1 6 Claims

Substituted urea derivatives having useful antibacterial activity as well as starting materials for their production and methods for preparing the said starting materials; pharmaceutical compositions containing the subject urea derivatives as active ingredient and method for the production of tuberculostatic effects. An illustrative embodiment is 1-(1-adamantyl-3-(3,4-dichloro-phenyl)-urea. One starting material variation is the use of 2-oxa-adamantane-1-amines.

3,621,041
CHROMANS

Russell Kwok, and Albert Pohland, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 5, 1968, Ser. No. 742,481
Int. Cl. C07d 7/20
U.S. Cl. 260—345.2 1 Claim

Des-N-methyldihydroacronycine and analogs thereof and a process for the preparation thereof comprising (1) halogenating a 7-alkoxy-2,2-dialkylchroman to the 6-halo derivative, (2) converting the b-halo derivative to the 5-amino-substituted chroman with sodium amide in liquid ammonia, (3) condensing the amine with an o-halobenzoic acid to yield the 2-carboxyanilino derivative and (4) cyclizing the carboxyanilino compound to the des-N-methyldihydroacronycine with polyphosphoric acid. Des-N-methyldihydroacronycine can be converted to acronycine, a known antitumor agent.

3,621,042
PROCESS FOR THE PREPARATION OF METHYL p-AMINOBENZENESULPHONYLCARBAMATE

Zdzislaw Jan Bujwid, London, and John Francis Hodgson, Romford, both of England, assignors to May F. Baker Limited, Dagenha, Essex, England

Filed Mar. 19, 1970, Ser. No. 21,194
Claims priority, application Great Britain, Mar. 20, 1969, 14,786/69
Int. Cl. C07c 143/80
U.S. Cl. 260—397.7 12 Claims

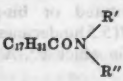
Methyl p-aminobenzenesulphonylcarbamate and its alkali metal and alkaline earth metal salts, which are useful as herbicides, are prepared by a new process which comprises reacting an alkali metal or alkaline earth metal salt of sulphanilamide with dimethyl carbonate in methanol at a temperature up to the boiling point of the reaction mixture. The free methyl p-aminobenzenesulphonylcarbamate can be obtained from the resulting alkali metal or alkaline earth metal salt of the sulphonylcarbamic ester by treatment with an acid.

3,621,043
N-SUBSTITUTED OCTADECADIENOIC ACID AMIDES AS CHOLESTEROL LOWERING AGENTS

Takashi Seki, Miyayamacho, Toyonaka; Chiharu Saito, Sonehigashi-machi, Toyonaka; Katsuyuki Toki, Kohshien-guchi, Nishinomiya; Keisuke Matsuka, Shonai-nishimachi, Toyonaka; Yoshio Suzuki, Kawaranomiya, Amagasaki, and Akira Kobayashi, Ikeda, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 478,758, Aug. 10, 1965, abandoned, which in turn is a continuation-in-part of application Ser. No. 342,682, Feb. 5, 1964, now abandoned. Filed Mar. 22, 1967, Ser. No. 642,266. Claims priority, application Japan, Feb. 6, 1963, 38/6314, 38/6315; Aug. 14, 1964, 39/46998; Aug. 28, 1964, 39/49074; Aug. 29, 1964, 39/49120, 39/49121
Int. Cl. C09f 7/00
U.S. Cl. 260—404 3 Claims

N-substituted octadecadienoic acid amides of the formula



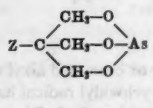
wherein R' is, for example, α-methylbenzyl and various other organic substituents, and R'' is hydrogen or a radical described with respect to R', are provided, which compounds exhibit cholesterol-lowering activity.

3,621,044
2,6,7-TRIOXA-1-ARSABICYCLO[2.2.2]OCTANE COMPOUNDS

John F. Deffner, Glenshaw, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 24, 1969, Ser. No. 819,122
Int. Cl. C07f 9/78; A01n 9/00, 9/24
U.S. Cl. 260—440 9 Claims

Novel derivatives of 2,6,7-trioxa-l-arsabicyclo[2.2.2]octane are useful as pesticides. The compounds are represented by the general formula



wherein Z can be alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkoxy, aryloxy, acyl, acyloxy, acyloxymethyl, benzoxymethyl, amino, nitro, nitrobenzoxymethyl, ammonium nitrobenzoate and chrysanthemumoxymethyl. Examples include

4-propyl-2,6,7-trioxa-1-arsabicyclo[2.2.2]octane
4-nitro-2,6,7-trioxa-1-arsabicyclo[2.2.2]octane
4-amino-2,6,7-trioxa-1-arsabicyclo[2.2.2]octane
4-acetoxymethyl-2,6,7-trioxa-1-arsabicyclo[2.2.2]octane
4-benzoxymethyl-2,6,7-trioxa-1-arsabicyclo[2.2.2]octane
4-(p-nitrobenzoxymethyl)-2,6,7-trioxa-1-arsabicyclo[2.2.2]octane
4-chrysanthemumoxymethyl-2,6,7-trioxa-1-arsabicyclo[2.2.2]octane
2,6,7-trioxa-1-arsabicyclo[2.2.2]octyl-4-ammonium p-nitrobenzoate.

3,621,045

PROCESS FOR THE PREPARATION OF ORGANOFLUOROSILANES

Richard Muller, Radebeul; Reiner Irmisch, Dresden, and Harald Rotzsche, Dresden, all of Germany, assignors to Insitut fur Silikon und Fluorkarbon-Chemie, Radebeul, Germany

Filed Nov. 4, 1968, Ser. No. 773,315
Int. Cl. C07d 7/12
U.S. Cl. 260—448.2 E 7 Claims

Process for preparing organofluorosilanes of the general formula $R_a\ R'_b\ Si\ F_{4-(a+b)}$ wherein a represent 0 to 2; b represents 1 to 3; $(a+b)$ is smaller than 4; R represents lower alkyl; R' stands for phenyl, iso-propoxy, trimethylsiloxy and anilino, which process comprises reacting hydrogensilanes of the general formula $R_a\ R°_b\ Si\ H_{4-(a+b)}$ wherein R_a, $R°_b$ and $(a+b)$ have the same meaning as above, with ammonium fluoride or ammonium-hydrogen fluoride preferably in a solution of an amine or amide, whereby hydrogen linked to Si is exchanged by F, while the R—Si and R'—Si bonds are unaffected. The so obtained organofluorosilanes are valuable starting products in the synthesis of organosilicon products.

3,621,046

ORGANOSILICON COMPOUNDS

Abe Berger, and Terry G. Selin, both of Schenectady, N.Y., assignors to General Electric Company

Filed Jan. 6, 1969, Ser. No. 789,397
Int. Cl. C07f 7/04, 7/18
U.S. Cl. 260—448.8 R 3 Claims

Monomeric organosilicon compounds having an alkyl substituent with two thioacid ester groups.

3,621,047

A BIS-AND TRIS-TRIALKOXYSILYLALKYLAMINES

Hans Dietrich Golitz, Cologne Stammheim; Walter Simmler, Odenthal-Schlinghofen, and Peter Schwabe, Leichlingen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 11, 1969, Ser. No. 857,203
Claims priority, application Germany, Sept. 20, 1968, P 17 94 197.8
Int. Cl. C07f 7/04
U.S. Cl. 260—448.8 R 5 Claims

Novel cross-linking agents are disclosed which can be combined with plastically shapable organopolysiloxanes; the resulting novel mixtures or compositions being storage stable under exclusion of all moisture. The cross-linking reaction takes place on exposure of the compositions to water, atmospheric humidity sufficing, at temperatures below 50° C. The compositions are especially adapted to be used for the filling of joints and as sealing materials in the building industry. The elastomers resulting therefrom have an increased adhesion to the substrate saving the expenditure of priming, and are transparent. The novel compositions comprise:

A. an α,ω-dihydroxy-poly-(diorgano-siloxane) which, in addition to its diorganosiloxane units, may contain up to 10 mol-percent of siloxane units having the formula $CH_3SiO_{3/2}$, and may be admixed with fillers and an α,ω-bis-(trimethyl-siloxy)-poly-(diorgano-siloxane); and

B. a cross-linking agent having the formula $[(RO—)_3Si—CH(R')—]_nNQ_{3-n}$

in which n is 2 or 3, R is an alkyl radical with 1 to 4 carbon atoms, R' is a hydrogen atom, an alkyl radical with 1 to 6 carbon atoms, a cyclohexyl radical a phenyl radical, and Q is an alkyl or alkenyl radical with 2 to 4 carbon atoms, an aralkyl radical with 7 to 10 carbon atoms, a dimethylaminoalkyl radical with 2 to 4 carbon atoms in its alkylene group, or a methoxy- or ethoxy-ethyl or -propyl radical.

3,621,048

QUATERNARY AMMONIUM COMPOUNDS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of application Ser. No. 578,981, Sept. 13, 1966, now abandoned. This application Mar. 14, 1968, Ser. No. 712,968
Int. Cl. C07c 155/02, 155/08
U.S. Cl. 260—455 A 10 Claims

Quaternary ammonium carbamate, thiocarbamate, dithiocarbamate and carbamide compounds. Typical examples are

$[C_4H_9NHCOO(CH_2)_2N^+(CH_3)_2C_{12}H_{25}]Br$
$[C4H_9NHCSO(CH_2)_2N^+(CH_3)_2C_{12}H_{25}]Br$
$[CH_3NHCSS(CH_2)_2N^+(CH_3)_2C_{12}H_{25}]Br$
$[C_2H_5NHCONH(CH_2)_2N^+(CH_3)_2C_{12}H_{25}]Br$

These compounds are effective against gram positive bacteria and fungi and reduce caries and inhibit formation of oral calculus. The thiocarbamates can be prepared by converting amino alcohols to sodium salts thereof with metallic sodium and reacting isothiocyanates with the sodium salts followed by quaternization. The carbamates can be prepared by reacting isocyanates with amino alcohols followed by quaternization. The dithiocarbamates can be prepared by reacting isothiocyanates with sodium salts of aminoalkanethiols followed by quaternization. The carbimides can be prepared by reacting isocyanates with alkanediamines followed by quaternization.

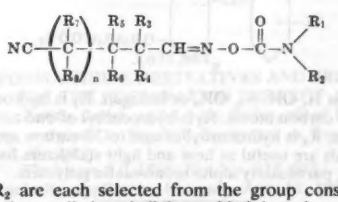
3,621,049

CYANOALKYLALDOXIME CARBAMATES

Roger Williams Addor, and David Edgar Ailman, both of Pennington, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 1, 1969, Ser. No. 812,325
Int. Cl. C07c 121/30, 121/52, 121/00
U.S. Cl. 260—465.4 7 Claims

Insecticidal and acaricidal compounds are provided having the formula:



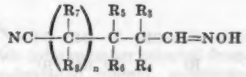
wherein:

R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl, and allyl, provided that when either R_1 or R_2 is hydrogen, the other substituent must be lower alkyl or allyl, and

R_3, R_4, R_5, R_6, R_7, and R_8 are each selected from the group consisting of lower alkyl, hydrogen and phenyl, and

n is 0 or 1.

The above compounds are prepared by a variety of process routes from novel cyanoalkylaldoxime intermediates of the formula:



wherein R_3, R_4, R_5, R_6, R_7, R_8 and n are as defined above.

3,621,050
METHOD FOR PRODUCING A PEROXYNITRATE

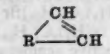
Donald R. Lachowicz; Todd S. Simmons, and Kenneth L. Kreuz, all of Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 541,431, Mar. 10, 1966, Pat. No. 3,466,326, Continuation-in-part of application Ser. No. 466,816, June 24, 1965, now Patent No. 3,415,856. Filed Feb. 19, 1969, Ser. No. 831,793

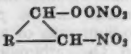
Int. Cl. C07c *77/00*

U.S. Cl. 260—466 **6 Claims**

Contacting a cycloalkene of the formula:



with a mixture of dinitrogen tetroxide and oxygen to produce peroxy nitrates of the formula:



which peroxy nitrates may be converted to alkandioic acids.

3,621,051
SUBSTITUTED (4-BENZOYL-2-HYDROXY PHENOXY) ALKYL THIOALKANOIC ACID ESTERS

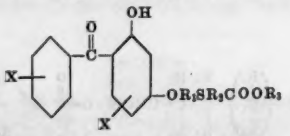
Ingenuin Hechenbleikner, Kenwood; John F. Hussar, Loveland; Arthur F. Koeniger, Cincinnati, and William P. Enlow, Reading, all of Ohio, assignors to Carlisle Chemical Works, Inc., Reading, Ohio

Filed Feb. 24, 1969, Ser. No. 801,791

Int. Cl. C07c *149/40*

U.S. Cl. 260—470 **11 Claims**

Compounds are prepared having the formula



where X is H, OH, R_4, OR_4 or halogen, R_1 is hydrocarbyl of two to six carbon atoms, R_2 is hydrocarbyl of one to four carbon atoms, R_3 is hydrocarbyl of one to 22 carbon atoms. The compounds are useful as heat and light stabilizers for organic polymers, particularly alpha mono-olefin polymers.

3,621,052
N-PROPIOPHENONE-NOREPHEDRINES AND SALTS THEREOF

Kurt Thiele, Frankfurt am Main, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

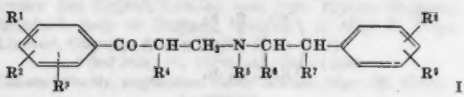
Filed July 1, 1968, Ser. No. 749,555

Claims priority, application Germany, June 29, 1967, P 15 93 836.0

Int. Cl. C07c *95/08*

U.S. Cl. 260—570.5 C **6 Claims**

Amino ketones of the formula



I

wherein:

R^1 is selected from the group consisting of —Br, lower alkyl, $—NH_2$ and trifluoromethyl;

R^2 and R^3 are selected from the group consisting of —H, —Cl, —Br, lower alkyl, —OH and lower alkoxy;

R^4 is —H, methyl or ethyl;

R^5 is —H or lower alkyl;

R^6 is —H or methyl;

R^7 is —H or —OH and

at least one of R^8 and R^9 is —OH and the other is —H, —OH, halogen, lower alkyl or lower alkoxy and certain amino ketones of said formula wherein R^4, R^5, R^6 and R^9 are —H, R^6 is methyl and R^7 is —OH and their pharmacologically acceptable acid addition salts and quaternary ammonium salts, such compounds having pharmaceutical activity in improving the heart function.

3,621,053
PROCESS FOR RECOVERING ITACONIC ACID AND SALTS THEREOF FROM FERMENTED BROTH

Tatsuyoshi Kobayashi, RA 24,537 Ikejiri-cho Setagaya-ku, and Isei Nakamura, 14-9, 2-chome, Arai, both of Tokyo, Japan

Filed Dec. 27, 1967, Ser. No. 693,706

Int. Cl. C07c *51/42, 51/52*

U.S. Cl. 260—527 R **4 Claims**

By adding a suitable amount of basic lead carbonate to the filtrate of itaconic acid fermentation broth, the lead salt of the itaconic acid is precipitated and then separated from the solution. This lead salt of the acid is double decomposed by adding a solution of carbonate or bicarbonate of alkali or ammonium. The precipitate of basic lead carbonate formed in the solution can be separated and recycled to the first step of the process. The alkali or ammonium salt of the itaconic acid in solution can then be crystallized by concentration to obtain said acid salt or contacted with a cation-exchanger to form the free acid which can be crystallized from the solution.

3,621,054
PRODUCTION OF METHACRYLIC ACID

Kenneth L. Olivier, 709 Emerald Way, Placentia, Calif.

Filed July 31, 1967, Ser. No. 657,011

Int. Cl. C07c *51/32, 67/00*

U.S. Cl. 260—533 A **14 Claims**

Methacrylic acid is produced by the oxidative carbonylation of propylene by contacting propylene, oxygen and carbon monoxide in the presence of a Group VIII noble metal catalyst containing a redox agent and an alkali metal acetate. Preferably the oxidation is performed in liquid phase comprising a low molecular weight fatty acid as the solvent. In a typical embodiment, the Group VIII noble metal concentration is from 0.001 to 1.0 molar, the concentration of the redox metal is from 0.05 to 0.5 molar, the concentration of the halide anion is from 0.1 to 0.5 molar and the carbon monoxide partial pressure is from 10 to about 70 percent of the total pressure which is from about 300 to 3,000 p.s.i.g. Under these conditions a substantial portion of the product comprises the desired methacrylic acid.

3,621,055
UREA DERIVATIVES AND METHODS FOR CONTROLLING UNWANTED PLANT GROWTH

Adolf Fischer, Mutterstadt Pfalz; Karl-Heinz Koenig, Ludwigshafen; Gustav Steinbrunn, Schwegenheim Pfalz, and Albrecht Zwchocke, Bad Duerkheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed July 10, 1967, Ser. No. 652,034

Claims priority, application Germany, July 19, 1966, P 15 42 834.9 Jan. 17, 1967, P 16 42 217.6

Int. Cl. C07c *127/22*

U.S. Cl. 260—545 R **5 Claims**

Urea derivatives and method for controlling unwanted plant growth.

3,621,056

SUBSTITUTED BENZYLIDENEAMINO GUANIDINES

William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed Aug. 16, 1968, Ser. No. 753,068
Int. Cl. C07c *109/18*
U.S. Cl. 260—545 R 2 Claims

Benzylideneamino guanidines substituted with lower alkanoyl groups, e.g., 1-(2,6-dichlorobenzylideneamino)-3-acetoxy-2,3-diacetylguanidine, are useful as hypotensives.

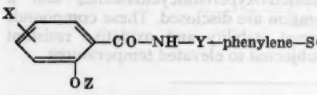
3,621,057

BENZENESULFONYL-UREAS AND PROCESS FOR THEIR MANUFACTURE

Helmut Weber, Frankfurt/Main; Walter Aumuller, Kelkheim/Taunus; Rudi Weyer, Frankfurt/Main; Karl Muth, Kelkheim/Taunus, and Felix Helmut Schmidt, Mannheim-Neuostheim, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Nov. 29, 1966, Ser. No. 597,539
Claims priority, application Germany, Dec. 2, 1965, F 47,816
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 DA 12 Claims

Benzenesulfonyl-ureas of the formula



in which R^1 is alkyl or alkenyl of two to eight carbon atoms, cycloalkyl of five to eight carbon atoms, cyclohexyl-lower alkyl, lower alkyl-cyclohexyl, lower alkoxy-cyclohexyl, phenyl-lower alkyl, endoalkylene-cyclohexyl, endoalkylene-cyclohexenyl, endoalkylene-cyclohexylmethyl or endoalkylene-cyclohexenylmethyl having one to two carbon atoms in the endoalkylene moiety, cyclohexenyl or cyclohexenylmethyl; Y is an alkylene of one to four carbon atoms; Z is phenyl or ptolyl; and X is hydrogen, methyl, chloro or nitro substituted in the four- or five-position; and physiologically tolerable salts thereof are disclosed as having utility as orally administrable hypoglycemic agents in the treatment of diabetes mellitus.

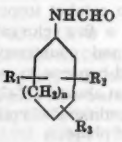
3,621,058

NOVEL FORMAMIDO-CYCLOALKANE DERIVATIVES

Masuo Murakami, Tokyo; Masaru Iwanami, Kanagawa-ken; Kazuo Kubo, Saitama-ken; Kenji Sano, Saitama-ken; Mashiro Kochiya, Tokyo, and Hideki Arima, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed June 25, 1969, Ser. No. 836,648
Claims priority, application Japan, June 27, 1968, 43/44158
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 R 15 Claims

Novel formamido-cycloalkane derivatives of the formula



wherein R_1 and R_2 are same or different and each represents a hydrogen atom or an alkyl radical having one to five carbon atoms, R_3 represents an alkyl radical having one to 10 carbon atoms and *n* is an integer from one to two. The compounds are excellent as analgesic.

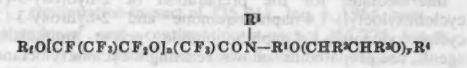
3,621,059

AMIDES OF HEXAFLUOROPROPYLENE OXIDE POLYMER ACIDS AND POLYANLYLENE OXIDE

Philip Lee Bartlett, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1969, Ser. No. 846,269
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 HL 11 Claims

Amides derived from hexafluoropropylene oxide polymer acids and polyalkylene oxide having the formula:



wherein R_f is a perfluorozlkyl radical having one to eight carbon atoms, *n* is an integer of zero to 100, R^1 is an alkylene radical having two to 12 carbon atoms, R^2 is hydrogen or an alkyl radical having one to four carbon atoms, R^3 is hydrogen or an alkyl radical having one to four carbon atoms, at least one of R^2 and R^3 in each repeating unit being hydrogen, y is an integer of one to 60, R^4 is hydrogen or an alkyl radical having one to four carbon atoms, and R^5 is hydrogen or an alkyl radical having one to six carbon atoms. These amides function efficiently as surfactants and emulsifying agents.

3,621,060

PROCESS FOR PREPARATION OF ENAMINES FROM HYDROCARBYLSILANES

Terry G. Selin, Schenectady, N.Y., assignor to General Electric Company

Filed Jan. 3, 1969, Ser. No. 788,936
Int. Cl. C07c *85/08*; C07f *7/08*
U.S. Cl. 260—563 R 8 Claims

A ketonic hydrocarbon is converted to an enamine by heating a mixture of the ketonic hydrocarbon with an organosilane having at least one dialkylamino group directly attached to the silicon. In the reaction, the organosilicon is converted to a organopolysiloxane.

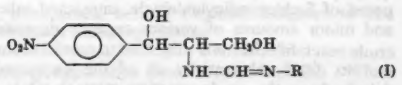
3,621,061

NEW FORMAMIDINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Pal Benko; Zoltan Budai, and Laszlo Pallos, all of Budapest, Hungary, assignors to Egyesult Gyogyszer es Tapszergyar, Budapest, Hungary

Filed Apr. 11, 1969, Ser. No. 815,503
Claims priority, application Hungary, Apr. 12, 1968, EE-1507
Int. Cl. C07e *123/00*
U.S. Cl. 260—564 R 4 Claims

Compounds of the general formula I and their acid addition salts



(I)

wherein R stands for a member selected from the group consisting of unsubstituted phenyl, substituted phenyl, and naphthyl radicals, wherein the substituent of the phenyl group is selected from the group consisting of halogen, lower alkyl, lower alkoxy, trihalomethyl, nitro group, and a combination thereof, wherein the halogen substituent may be one or two halogen atoms. These compounds have antimicrobial effect.

3,621,062

2-(8-CYCLOHEXYLOCTANOYL OR 7-CYCLOHEXYLHEPTANOYL)-1-NAPHTHOL

Sydney Archer, Bethlehem, and Roman R. Lorenz, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 589,202, Oct., 1966, now abandoned. This application Nov. 26, 1969, Ser. No. 880,370

Int. Cl. C07c *49/82*

U.S. Cl. 260—590 **2 Claims**

Intermediates for the preparation of 2-hydroxy-3-(8-cyclohexyloctyl)-1,4-naphthoquinone and 2-hydroxy-3-(7-cyclohexylheptyl)-1,4-naphthoquinone, potent antimalarial agents, are prepared as follows: reacting 8-cyclohexyloctanoic acid or 7-cyclohexylheptanoic acid with 1-naphthol to form 2-(8-cyclohexyloctanoyl or 7-cyclohexylheptanoyl)-1-naphthol; reducing the 2-acyl-1-naphthol to form 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)1-1-naphthol; oxidizing 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1Napthol to form 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1,4-naphthoquinone; reacting the latter with a peroxide under alkaline conditions to form 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1,4-naphthoquinone-2,3-oxide; and, hydrolyzing the 2,3-oxide under acidic conditions to yield 2-hydroxy-3-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1,4-naphthoquinone.

3,621,063

UNSATURATED ACYCLICKETONES

Alfred A. Schleppnik, St. Louis, and Marvin L. Oftedahl, Crestwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 579,226, Sept. 14, 1966, Pat. No. 3,455,960. Filed Dec. 24, 1968, Ser. No. 798,847

Int. Cl. C07c *49/24*

U.S. Cl. 260—594 **6 Claims**

Preparation of 4-pyrones by reacting (a) hydroxy or unsaturated ketone with a formate ester, (b) acetylating the condensation product, (c) replacing the acetoxy group with a mono- or dialkoxy group, (d) epoxidation of the remaining unsaturated linkage, (e) cyclization of the intermediate, (f) oxidation to yield the dihydro-4-pyrone derivative, (g) acid hydrolyze to yield the 4-pyrone derivative.

The intermediates are new and valuable compounds.

4-Pyrones are utilized as flavor enhancers in food products.

3,621,064

PRODUCTION OF 5-CHLOROSALICYLALDEHYDE

Jacob Rosin, Maplewood, N.J., assignor to Chris-Craft Industries, Inc.

Filed July 7, 1969, Ser. No. 839,638

Int. Cl. C07c *47/56*

U.S. Cl. 260—600 **8 Claims**

5-Chlorosalicylaldehyde, m.p. 100.6° to 101.0° C., purity 99+ percent when measured by gas chromatography, is produced in excellent yields by reaction process in which (a) salicylaldehyde is reacted with approximately an equimolar quantity of chlorine to form a crude reaction mixture composed of 5-chlorosalicylaldehyde, unreacted salicylaldehyde and minor amounts of various organic impurities, (b) the crude reaction mixture is subjected to partial vacuum distillation to distill substantially all of the unreacted salicylaldehyde from the crude reaction mixture while leaving 5-chlorosalicylaldehyde and the various organic impurites in the distillation residue, (c) the vacuum-topped distillation residue is dissolved in an aqueous solution of a lower alkanol from which solution 5-chlorosalicylaldehyde crystallizes while leaving the organic impurities dissolved in solution, and (d) the crystallized 5-chlorosalicylaldehyde is recovered. Unless the crude reaction mixture is vacuum topped to remove substantially all of the unreacted salicylaldehyde, then the crystallization of 5-chlorosalicylaldehyde requires relatively large amounts of solvent and yields a product with a low-bulk density.

3,621,065

2,6-BIS(THIOMETHYL)-4-METHYL ANISOLE

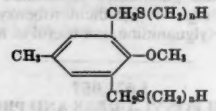
Harold Marvin Foster, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Oct. 13, 1969, Ser. No. 865,981

Int. Cl. C07c *149/00*; A01n *9/24*; C09g *1/00*

U.S. Cl. 260—609 D **3 Claims**

A class of compounds having the structure:



where *n* is an integer from 0 to 3.

These compounds are useful as microbiocides.

3,621,066

SUBSTITUTED HALOCYCLOALKENES

Richard W. Anderson, Midland, Mich., and Claude I. Merrill, Lancaster, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 20, 1967, Ser. No. 647,337

Int. Cl. C07c *41/00, 43/18*

U.S. Cl. 260—611 R **7 Claims**

Mono and diperhaloalkoxyperhalocycloalkenes and a method of their preparation are disclosed. These compounds exhibit excellent thermal stability and oxidative resistant characteristics when subjected to elevated temperatures.

3,621,067

VINYL FLUORIDE FROM 1-FLUORO-2-CHLOROETHANE BY PYROLYSIS IN THE PRESENCE OF BROMINE

Joseph Warren Hamersma, Tustin, Calif., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed July 23, 1969, Ser. No. 844,203

Int. Cl. C07c *17/34, 21/18*

U.S. Cl. 260—653.5 **6 Claims**

1-fluoro-2-chloroethane is pyrolized in the presence of bromine to vinyl fluoride. The pyrolysis occurs at 450° C. to 600° C. in bromine to 1-fluoro-2-chloroethane ratios of 1:10,000 to 1:15. O_2, Cl_2 and I_2 react similarly.

3,621,068

MANUFACTURE OF NAPHTHENIC HYDROCARBONS BY HYDROGENATING THE CORRESPONDING AROMATIC HYDROCARBONS

Gabriel Jacques, Saint Cloud; Alphonse Zuech, Montesson; Alain Convers, Rueil Malmaison, and Jacques Paumier, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, France

Filed Dec. 4, 1969, Ser. No. 882,054

Claims priority, application France, Dec. 9, 1968, 177,338

Int. Cl. C07c *5/10*

U.S. Cl. 260—667 **5 Claims**

A process of hydronating benzene to cyclohexane, comprising the steps of:

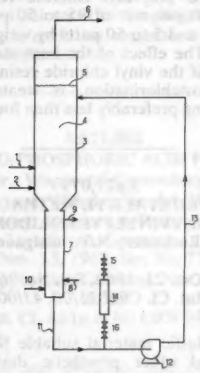
a. intermittently circulating a liquid stream comprising particulate hydrogenation catalyst suspended in liquid benzene downwardly through a first elongated zone, and passing hydrogen upwardly and countercurrently to said liquid stream to convert said benzene to cyclohexane, the conversion being conducted at about 125°–275° C. and about 5–100 atmospheres under conditions wherein said benzene remains essentially in the liquid phase;

b. withdrawing gaseous cyclohexane product and excess hydrogen from the top of said first elongated zone;

c. withdrawing resultant hydrogenated benzene stream containing said dispersed particulate hydrogenation catalyst from the bottom of said first elongated zone, and passing said resultant stream downwardly through a second elongated zone, said second zone being a heat exchange zone compris-

ing a plurality of tubular passageways surrounded by coolant fluid;

d. withdrawing resultant cooled hydrogenated benzene stream from the bottom of said second zone and recirculating same to the top part of said first zone; and



e. stopping the circulation of said liquid streams intermittently, and at least during the period during which the circulation is stopped, injecting hydrogen into the bottom of the second elongated zone, passing upwardly through said tubular passageways and said first elongated zone so as to diminish the extend of settling of said particulate catalyst whereby plugging of said tubular passageways is substantially avoided.

3,621,069

METHOD FOR PREPARING α,α′-DICUMYL FROM α-CUMENE HYDROPEROXIDE

James C. Wygant, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 24, 1969, Ser. No. 860,784

Int. Cl. C07c *15/00, 15/02*

U.S. Cl. 260—668 **9 Claims**

Cumene hydroperoxide is decomposed in the presence of cumene at an elevated temperature and superatmospheric pressure to form α,α′-dicumyl, cumyl alcohol, and water.

3,621,070

PROCESS FOR PREPARING ISOCARYOPHYLLENE

Stanley Rachlin, South Amboy, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 873,100

Int. Cl. C07c *5/00*; B01j *11/74*; C09f *3/00*

U.S. Cl. 260—675.5 **6 Claims**

A process for preparing isocaryophyllene by heating caryophyllene at a temperature of from about 120°–235° C. in the presence of a suitable catalyst such as selenium, metal selenides which decompose to yield selenium, or sulfur. The catalyst may be supported or unsupported.

3,621,071

METHOD FOR DEHYDROGENATING AND CRACKING ALKANES AND OLEFINS

Charles R. Noddings, Midland; Andrew J. Dietzler, Midland, and Ronald G. Gates, Breckenridge, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 533,661, May 31, 1966, now abandoned , and a continuation-in-part of 604,661, Dec. 27, 1966, now Patent No. 3,409,701, dated Nov. 5, 1968, which is a continuation-in-part of application Ser. No. 335,810, Jan. 6, 1964, now abandoned , and a continuation-in-part of 335,841, Jan. 6, 1964, now abandoned , and a continuation-in-part of 335,775, Jan. 6, 1964, now abandoned , and a continuation-in-part of 335,784, Jan. 6, 1964, now abandoned. This application Mar. 21, 1968, Ser. No. 714,816

Int. Cl. C07c *3/32, 5/18*

U.S. Cl. 260—678 **7 Claims**

Aliphatic hydrocarbons are dehydrogenated and/or cracked using catalysts prepared by precipitating nickel with a phosphate ion or coprecipitating chromium and nickel with phosphate ions, the latter coprecipitation being carried out to produce a material having from six to 12 atoms of chromium per atom of nickel on one hand or six to 12 atoms of nickel per atom of chromium on the other hand. The catalyst is precipated in the gel form in the presence of ammonium hydroxide.

3,621,072

PROCESS FOR PRODUCING ISOPRENE

Yoshihiro Watanabe, Kobe; Jiro Kobayashi, Ibaragi-shi; Yoshiki Toyoshima, Niihama-shi; Tooru Tokumaru, Takatsuki-shi, and Masatosi Saito, Takatsuki-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Dec. 12, 1968, Ser. No. 783,410

Claims priority, application Japan, Dec. 23, 1967, 42/82803, Jan. 23, 1968, 43/3901, May 28, 1968, 43/37345, May 24, 1968, 43/35391, May 27, 1968, 43/36254, Aug. 15, 1968, 43/58331

Int. Cl. C07c *11/18*

U.S. Cl. 260—681 **10 Claims**

Isoprene is synthesized in high yield according to simple procedures and at low costs by passing a mixed gas comprising isobutylene, methanol and/or methyl ether, and oxygen gas, over a solid catalyst maintained at 100°–500° C. which contains as a component one member selected from the group consisting of oxides of vanadium, tungsten, molybdenum, uranium and the like, and mixtures thereof.

When said catalyst is supported on a silica gel as a carrier, a high synergistic effect can be attained. If necessary, an acid, or an alkali or alkaline earth metal compound, may be used as a promotor.

3,621,073

PROCESS FOR PRODUCING 2-METHYL-BUTENE-2 FROM BUTENE STREAMS

Brian Patrick McGrath, Crowthorne, and Keith Vaughan Williams, Shepperton, both of England, assignors to The British Petroleum Company Limited

Filed Sept. 4, 1968, Ser. No. 757,483

Claims priority, application Great Britain, Sept. 22, 1967, 43,177/67

Int. Cl. C07c *3/62, 11/18*

U.S. Cl. 260—683 D **18 Claims**

A mixture of normal and isobutenes is converted to 2-methylbutene-2 in a series of steps comprising purification, isomerization of butene-1 to butene-2 at a temperature below 0° C. using a catalyst comprising alkali metal treated alumina and reaction of butene-2 with isobutylene using a disproportionation catalyst comprising rhenium heptoxide on alumina. The 2-methylbutene-2 can be dehydrogenated to isoprene.

3,621,074

PRODUCTION OF A MODIFIED DIGLYCOL THEREPHTHALATE POLYCONDENSATE FOR INJECTION MOLDING

Erhard Siggel, Seckmauern; Walter Rein, Obernburg, and Horst-Manfred Caesar, Erlenbach, all of Germany, assignors to Glanzstoff AG, Wuppertal, Germany

Filed Nov. 22, 1968, Ser. No. 778,310
Claims priority, application Germany, Nov. 27, 1967, P 17 20 877.4
Int. Cl. C08g 45/14, 17/01; C06g 17/037
U.S. Cl. 260—835 12 Claims

Process of producing a polycondensate of a diglycol terephthalate especially suitable for injection molding purposes wherein the usual catalytic polycondensation is carried out after the incorporation of 0.1 to 5 percent by weight of a diglycidyl ether as a monomeric coreactant up to a solution viscosity of 1.4 to 1.8, at which point the polycondensate melt is immediately cooled and solidified, the product then being further condensed in the solid phase under an inert atmosphere at temperatures of 180° to 230° C. until the melt index of the product acquires a value of between 50 and 0.5 grams/10 minutes.

3,621,075

DYEABLE POLYOLEFINS AND METHOD FOR PRODUCING SAME

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation-in-part of application Ser. No. 640,186, May 22, 1967, now abandoned. This application Oct. 8, 1969, Ser. No. 868,276
Int. Cl. C08g 41/04
U.S. Cl. 260—857 L 11 Claims

The dye receptivity of polyolefins is improved by mixing 100 parts by weight of at least one polymer or copolymer of a 1-olefin having two through eight carbon atoms per molecule with one to 20 parts by weight of a novel dye-receptive nonbasic polyamide modifier produced by polycondensing a diamine of which both amino groups are secondary with a hydrocarbon dicarboxylic acid.

3,621,076

BLOCK POLYHETEROCYCLIC POLYIMIDE ELASTOMERS HAVING HIGH THERMAL RESISTANCE

Walter F. De Winter, 45 Antwerpen Strsst, Mortsel, Belgium, and Jack Preston, 2703 Ashland St., Raleigh, N.C.

Filed Aug. 11, 1969, Ser. No. 849,140
Int. Cl. C08g 41/04, 20/00
U.S. Cl. 260—857 7 Claims

Segmented aromatic imide polymers useful for spinning into elastic manmade filaments are provided. Relatively low-melting polymeric amic-acid segments resulting from combining selected o-phthalic acid derived diamines with aromatic dianhydrides and relatively high-melting polymeric amic-acid segments resulting from combining isophthalic acid or terephthalic acid derived diamines with aromatic dianhydrides are joined together and heated to form a segmented elastomeric polyimide.

3,621,077

SOLVENT RESISTANT THERMOPLASTIC POLYMERS

Frank J. Donat, Mantua, Ohio, assignor to The B.F. Goodrich Company, New York, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,859
Int. Cl. C08f 15/40
U.S. Cl. 260—879 9 Claims

Solvent resistant thermoplastic rubbery compositions which have a good balance of low temperature properties have been prepared. The present compositions are three-block polymers obtained by the sequential polymeization of a vinyl-substituted aromatic hydrocarbon monomer, a conjugated diene monomer and a $\alpha\beta$-olefinically unsaturated nitrile monomer.

3,621,078

CHLORINATION OF A GRAFT POLYMER OF A VINYL AROMATIC ON POLYVINYL CHLORIDE

Hajime Kitamura, and Toshihide Shimizu, both of Niigata-ken, Japan, assignors to Shin-Etsu Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 595,609, Nov. 21, 1966, now abandoned. This application Jan. 8, 1969, Ser. No. 789,914
Int. Cl. C08f 19/02
U.S. Cl. 260—884 16 Claims

A heat-stabilized polyvinyl chloride resin prepared by chlorinating a graft polymer of 95 to 50 parts by weight of polyvinyl chloride and 5 to 50 parts by weight of a vinyl aromatic monomer. The effect of the heat stabilization will be further increased if the vinyl chloride resin, after being subjected to the postchlorination, is treated with olefinic hydrocarbon, having preferably less than four carbon atoms.

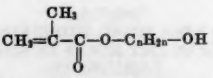
3,621,079

GRAFT OF HYDROXYALKYL METHACRYLATE ONTO POLYVINYLPYRROLIDONE

Harry R. Leeds, Rochester, N.Y., assignor to Patent Structures, Inc.

Filed Oct. 21, 1968, Ser. No. 769,032
Int. Cl. C08f 21/00, 43/00
U.S. Cl. 260—885 11 Claims

A polymeric plastic material suitable for contact lenses, dental liners and other prosthetic devices, intrauterine devices, and other devices to be used in or in the treatment of the body. It is made from a monomer having the formula



wherein n is 2 or 3, polymerized with polyvinyl pyrrolidone or polyvinyl pyrrolidone/vinyl acetate copoylmer. The application also discloses procedures for making contact lenses, dental liners, and intrauterine devices from such polymeric material.

3,621,080

RESIN COMPOSITIONS HAVING A BASE OF POSTCHLORINATED POLYVINYL CHLORIDE AND A PROCESS FOR THE PREPARATION THEREOF

Robert De Coene, Brussels, Belgium, assignor to Solvary & Cie, Brussels, Belgium

Filed Feb. 20, 1969, Ser. No. 801,196
Claims priority, application Netherlands, Feb. 23, 1968, 6802617
Int. Cl. C08f 29/12
U.S. Cl. 260—897 C 7 Claims

Resin compositions containing postchlorinated polyvinyl chloride and heterogeneously chlorinated polyethylene are prepared by chlorinating an aqueous suspension of polyvinyl chloride until the chlorine content of the polymer reaches a predetermined value between 58 percent and 73 percent by weight, introducing polyethylene into the aqueous suspension in an amount of 5 to 50 percent by weight with respect to the sum of the quantities of polyvinyl chloride and polyethylene and then subjecting the polyethylene to the action of chlorine at a temperature below 85° C. The resulting resin is easy to work and has a high impact strength and high resistance to heat deformation.

3,621,081

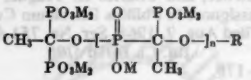
OLIGOMERIC ESTER CHAIN CONDENSATES OF ETHANE-1-HYDROXY-1,1-DIPHOSPHONIC ACID

James B. Prentice, Batesville, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 23, 1968, Ser. No. 786,371
Int. Cl. C07f 9/38, 9/40
U.S. Cl. 260—924 2 Claims

Organo-phosphorus compounds which are oligomeric ester

chain condensates of ethane-1-hydroxy-1,1-diphosphonic acid having the following formula:



wherein M is a water-soluble cation; R is hydrogen or acetyl and *n* has a numerical value in the range of 1 to about 16. The compounds are useful as sequestering agents and builders in detergent compositions.

3,621,082

AMIDO-THIONO-PHOSPHORIC ACID PHENYL ESTERS

Gerhard Schrader, Wuppertal-Cronenberg; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal-Vohwinkel, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 13, 1968, Ser. No. 775,540

Claims priority, application Germany, Nov. 30, 1967, P 16 68 047.0

Int. Cl. A01n 9/36; C07f 9/08

U.S. Cl. 260—941 **14 Claims**

(N-unsubstituted and N-mono- and N,N-di- -alkyl-substituted amido-0-alkyl-0-[(2-carboalkoxy and 2-carbocycloalkyloxy, i.e. 2-alkoxy carbonyl and 2-cycloalkyloxy carbonyl) phenyl]-thiono-phosphoric acid esters which possess arthropodicidal, especially acaricidal and insecticidal, properties and which may be produced by reacting the corresponding thiono-phosphoric acid diester monohalide with ammonia or a primary or secondary amine.

3,621,083

PROCESS FOR PREPARATION OF PHOSPHORUS CONTAINING COMPOUNDS

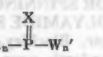
Glenn R. Price, San German, P.R., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Apr. 30, 1968, Ser. No. 725,505

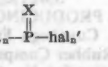
Int. Cl. C07f 9/08, 9/16, 9/22

U.S. Cl. 260—968 **7 Claims**

A process for preparing organophosphorus compounds of the formula:



wherein R is a radical substantially hydrocarbon in nature but which can contain relatively inert substituents, X is a chalcogen having an atomic weight less than about 35, W is a pseudohalide selected from CN, NCO, and NCS groups, and *n* and *n'* are integers of from one to two, the sum of which is not greater than three. The process comprises reacting an organophsophorus halide of the formula:



R, X, *n* and *n'* are as previously defined and hal is a halogen having an atomic weight between about 30 and 85; with a salt of pseudohalide in the presence of a catalytic amount of a tertiary amine.

3,621,084

PROCESS OF PRODUCING TRIALKYL PHOSPHITES

Lawrence F. Humphrey, Yonkers, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed June 28, 1968, Ser. No. 740,902

Int. Cl. C07f 9/08

U.S. Cl. 260—976 **5 Claims**

A process of producing trialkyl phosphites by reacting phosphorus trichloride with an alcohol in an inert solvent wherein a tertiary amine is added as a hydrogen chloride acceptor along with anhydrous ammonia. The improvement comprises the steps of maintaining the pH at between 6 and 8 and a temperature between 40° and 80° C. for reacting a phosphorus trichloride with the alcohol. Moreover, the anhydrous ammonia is added after the initial reaction between the phosphorus trichloride and the alcohol so as to not interfere therewith.

3,621,085

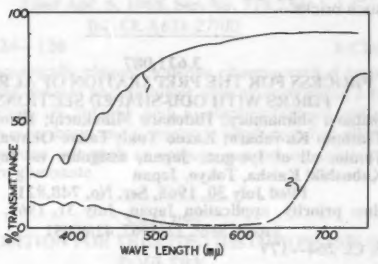
PRODUCTION OF LIGHT-POLARIZING FILM

Rinjiro Ichikawa, Ootsu, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1969, Ser. No. 808,940

Claims priority, application Japan, Mar. 28, 1968, 43/20590, June 7, 1968, 43/39325

U.S. Cl. 264—2 **5 Claims**



A light-polarizing film of a polymer selected from the group consisting of polyvinyl chloride, polyvinyl bromide and polyvinylidene chloride is produced by heating the polymer at a temperature of 90°–150° C. in the presence of a tertiary aliphatic amine having a boiling point higher than 90° C. as dehydrohalogenating agent to cause partial dehydrohalogenation, heating the product at a temperature of 70°–150Φ*v* C. to produce conjugated double bond chains, and then molecularly orienting the product in at least one direction by stretching the product more than 1.2 times its length at a temperature above 100° C.

3,621,086

METHOD FOR MAKING FACING BRICK WITH VARIED COLOR AND TEXTURE

Charles James Gulde, Amarillo, Tex., assignor to Crowe-Gulde Cement Company, Amarillo, Tex.

Division of Ser. No. 489,625, Sept. 23, 1965, Pat. No. 3,425,105.

Filed Dec. 9, 1968, Ser. No. 782,216

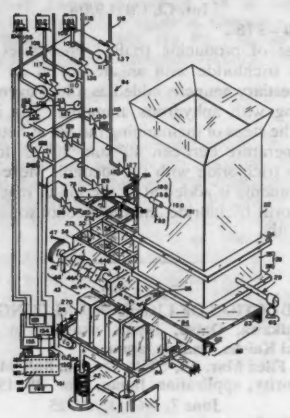
application Dec. 9, 1968, Ser. No. 782,216

Int. Cl. B28b 1/08, 1/16, 1/32

U.S. Cl. 264—71 **6 Claims**

A process for making concrete brick which has a sufficiently smooth and attractively colored surface to be used as a facing or outside surface building unit. Colors are applied as fluid color mixes to a plurality of the vertical faces of the mold chambers in a block making machine prior to adding concrete mix thereto. Rapidly thereafter, concrete mix is added and the mold is vibrated to compact the mix and concurrently distribute over the surface of the material in the

mold portions of the color mix to achieve a desired color effect. The color mix applied to the mold surface may be



changed according to a predetermined pattern on each batch of such bricks.

3,621,087

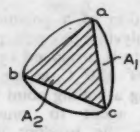
PROCESS FOR THE PREPARATION OF ACRYLIC FIBERS WITH ODD-SHAPED SECTIONS

Masaharu Shimamura; Hideharu Minakuchi; Hiroshi Sakai; Tsutomu Kuwabara; Kazuo Yuki; Takao Okawa, and Abe Tamio, all of Iyo-gun, Japan, assignors to Toyo Rayon Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1968, Ser. No. 748,821

Claims priority, application Japan, July 31, 1967, 42/48781, Japan, Sept. 22, 1967, 42/60451

U.S. Cl. 264—177 **5 Claims**



Process for the preparation of acrylic fibers with odd-shaped cross sections which comprises spinning, as the spinning solution, an organic solvent solution of a polymer containing at least 85 mol percent of acrylonitrile, at an extrusion rate of no higher than 10 meters per minute, through odd-shaped orifices of the configuration having a shape factor of not less than 16, the shape factor being defined as

$$\frac{(\text{Peripheral length of an orifice})^2}{\text{Cross-sectional area of an orifice}}$$

into a spinning bath which consists of aqueous solution of an organic solvent at a concentration of 30–60 percent and is maintained at a temperature not higher than 35° C., with a jet stretch of not less than 0.9.

3,621,088

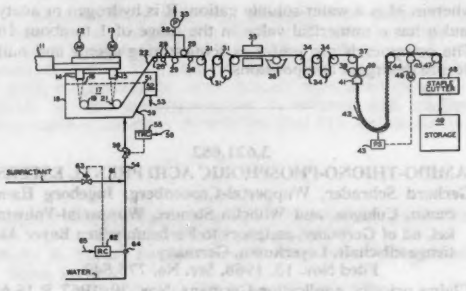
HIGH PRODUCTION OF WATER-QUENCHED FILAMENTS

Charles S. Hatcher, and Charles H. Teague, both of Greenville, S.C., assignors to Phillips Petroleum Company

Filed Aug. 9, 1968, Ser. No. 751,459

Int. Cl. D01d *5/08*

U.S. Cl. 264—178 **19 Claims**



Melt-spinnable thermoplastic polymeric filaments are melt extruded from at least one spinneret die plate having at least 25 spinning orifices per square inch of effective spinning area through an airgap of less than 1 inch into a liquid quench medium, for example, water. The surface tension of the quench liquid is maintained at least below 65 dynes per centimeter.

The as-spun filaments can have a denier per filament in the range of about 4 to about 600. Polypropylene filaments processed in this manner have an X-ray diffraction pattern for the diffraction angle 2θ in the range of $10°2\theta$ to $25°2\theta$ characterized by two broad peaks located at about $15°2\theta$ and about $21°2\theta$; a crystal orientation pattern for an X-ray diffraction angle of about $14°2\theta$ which exhibits a maximum at about the equator; a differential scanning calorimeter thermogram characterized by an exothermic peak at about 90° C.; and a crystallinity of less than 50 percent. The corresponding drawn polypropylene filaments have an equatorial X-ray diffraction pattern for the diffraction angle 2θ in the range of $10°2\theta$ to $25°\ 2\theta$ characterized by a single peak located at about $15°\ 2\theta$, and a crystallinity of less than 55 percent.

3,621,089

PROCESS FOR SPINNING DYE-RESISTANT COPOLYAMIDE FILAMENTS

Owen Burchell Edgar, Blackley, Manchester, and Michael Richard Yates, Horsforth, near Leeds, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 13, 1966, Ser. No. 578,980

Claims priority, application Great Britain, Sept. 16, 1965, 39588/65

Int. Cl. D01f *1/02*

U.S. Cl. 264—211 **4 Claims**

A terpolyamide, formed from reactants polymerized in the presence of the equivalent of at least 3.0 mole percent of a monofunctional acid or basic stabilizer, is melt spun into filaments which are subsequently cold drawn.

3,621,090

PROCESS FOR PRODUCING NYLON TIRE CORD

Richard W. Kibler, Cuyahoga Falls, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of application Ser. No. 444,464, Mar. 31, 1965, now Patent No. 3,459,251, dated Aug. 5, 1969.

Filed Dec. 10, 1968, Ser. No. 783,466

Int. Cl. B29c *25/00*

U.S. Cl. 264—235 **1 Claim**

The flatspotting characteristics of nylon tire cord rein-

forced tires can be substantially minimized by including in

the nylon tire cord the reaction product of boric acid and an aliphatic alcohol.

3,621,091

PROCESS FOR INSOLUBILIZING A POLYPHENYLENE ETHER FIBER

Jerome J. Hertz, Broomall, Pa., and William E. Salvadore, South Lee, Mass., assignors to General Electric Company

Continuation-in-part of application Ser. No. 639,295, May 18, 1967, now abandoned. This application Sept. 8, 1969, Ser. No. 856,218

Int. Cl. D02j *1/22*; **C08q** *23/16*

U.S. Cl. 264—290 R **6 Claims**

Orienting and heat-treating polyphenylene ether fibers. Conditions include orienting by stretching 3–10X at 200°–300° C. and subsequently treating at 350°–520° C. by relaxing up to 70 percent, heating at constant length or redrawing up to 5X. The processing increases crystallinity, improves tensile properties and results in fiber insolubility in various conventional drycleaning solutions.

3,621,092

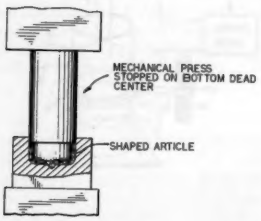
STAMPING PROCESS

Peter H. Hofer, Berkeley Heights, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 714,205, Mar. 19, 1968. This application Feb. 20, 1969, Ser. No. 801,129

Int. Cl. B29c *3/00*

U.S. Cl. 264—322 **7 Claims**



A process for stamping a stampable glass fiber reinforced composite made from thermoplastic resin and a lofty glass fiber mat.

3,621,093

PROCESS FOR MAKING REINFORCED THERMOSET ARTICLES

Glenn R. Svoboda, Grafton, Wis.; Fred G. Singleton, Pittsburgh, Pa., and Lindley H. Eshleman, Port Washington, Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Continuation-in-part of application Ser. No. 516,739, Dec. 27, 1965, now abandoned. This application July 1, 1969, Ser. No. 838,339

Int. Cl. B29g *1/00*

U.S. Cl. 264—331 **6 Claims**

An improved process for rapidly making reinforced thermoset articles from molding compositions which include unsaturated polyester resins and fillers utilizing molding apparatus having heated mold surfaces. The molding composition includes 0.1 to 0.20 parts by weight of polyacrylates of polyepoxides. The cure time for the resulting article is less than one-half that required for molding compositions containing the identical unsaturated polyester resins without the polyacrylates of polyepoxides.

3,621,094

CONCENTRATED AQUEOUS LIQUID ANTACID COMPOSITIONS CONTAINING CERTAIN PHOSPHATE AND GLUCONATE SALTS

David Mayron, Whitpain Township, and Frank J. Tiano, Philadelphia, both of Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Apr. 5, 1968, Ser. No. 719,234

Int. Cl. A61k *27/00*

U.S. Cl. 424—128 **6 Claims**

Pharmaceutically elegant aqueous pharmaceutical suspensions having antacid and antiulcer activity comprising a high concentration of antacid and a combination of calcium phosphate monobasic and a nontoxic alkali metal or alkaline earth gluconate salt such as sodium, potassium, calcium or magnesium gluconate.

3,621,095

COMPOSITION FOR TREATING HISTOMONIASIS IN POULTRY

Edward W. Berndt, and Robert D. Vatne, both of Charles City, Iowa, assignors to Salsbury Laboratories

Division of Ser. No. 641,112, May 25, 1967, Patent No. 3,424,845, dated Jan. 28, 1969, which is a continuation-in-part of application Ser. No. 525,300, Feb. 7, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 598,921, Dec. 5, 1966, now abandoned. Filed June 21, 1968, Ser. No. 767,549

Int. Cl. A61k *27/00*

U.S. Cl. 424—232 **7 Claims**

The new chemical compound 3,5-dinitrosalicylic acid, 5-nitrofur-furylidene hydrazide, compositions containing the same and its synergetic precursors, and treatments applying said compounds and compositions for the promotion of growth and the control of Histomoniasis in poultry.

3,621,096

ANTIDEPRESSANT METHOD AND COMPOSITION FOR SAME COMPRISING A TRICYCLIC ANTIDEPRESSANT AND A THYROID HORMONE

Arthur J. Prange, Jr., Chapel Hill; Ian C. Wilson, Chapel Hill, and Morris A. Lipton, Raleigh, all of N.C., assignors to The University of North Carolina, Chapel Hill, N.C.

Filed Apr. 3, 1969, Ser. No. 813,294

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 **7 Claims**

The antidepressant action of tricyclic antidepressants is enhanced by concurrent administration of thyroid hormone. A composition for treating depression comprises a tricyclic antidepressant and a thyroid hormone in pharmaceutically effective amounts admixed with a pharmaceutical carrier.

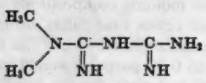
3,621,097

METHOD AND COMPOSITIONS FOR TREATMENT OF MENTAL ILLNESS

John F. Scott, Poole, England, assignor to Jan Marcel Didier Aron-Samuel, Suresness, France

Continuation-in-part of application Ser. No. 732,832, May 29, 1968, now abandoned. This application Mar. 30, 1970, Ser. No. 24,034
Int. Cl. A61u *27/00*
U.S. Cl. 424—247 4 Claims

A process for the treatment of mental illness comprising the administration of dimethyl biguanide of the formula



to an animal receiving an ataractic. A pharmaceutical composition comprising dimethyl biguanide and an ataractic.

3,621,098

HYPOTENSIVE METHODS AND COMPOSITIONS UTILIZING HEXAHYDROBENZO[ ]QUINOLIZINES

Jeffrey W. H. Watthey, and Karl J. Doebel, both of Ossining, N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 681,078, Nov. 7, 1967, Pat. No. 3,484,443. Filed Mar. 17, 1969, Ser. No. 862,092
Int. Cl. A61k *27/00*
U.S. Cl. 424—258 12 Claims

A hypotensive effect is achieved through the use of hexahydrobenzo[*b*]quinolizines characterized by the presence of at least 2 hydroxy or 2 alkoxy groups in the 7, 8, 9 and 10 positions. Also disclosed are pharmaceutical compositions utilizing these compounds.

3,621,099

THERAPEUTIC COMPOSITIONS AND METHODS FOR STIMULATING THE CENTRAL NERVOUS SYSTEM

Charles R. Jacobson, deceased, late of 9 Cottage Ave., Orange, N.J. (by Annie T. Jacobson, heir); Anthony D'Adamo, 17 Dillon Ave., West Caldwell, N.J., and Charlotte E. Cosgrove, 30 Maple Ave., West Orange, N.J.

Continuation of application Ser. No. 742,994, June 17, 1958, now abandoned. This application Mar. 5, 1969, Ser. No. 805,121
Int. Cl. A61k *27/00*
U.S. Cl. 424—269 10 Claims

Pharmaceutical compositions which are stimulating and which contain a pharmaceutical excipient and an alkyl-substituted urazole. The process of causing stimulation by administering the composition.

3,621,100

COMPOSITION AND METHOD FOR PRODUCING A TUBERCULOSTATIC EFFECT

Andre R. Gagneux, Basel, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 783,411, Dec. 12, 1968, which is a continuation-in-part of application Ser. No. 593,678, Nov. 14, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 593,703, Nov. 14, 1968, now abandoned. Claims priority, application Switzerland, Nov. 18, 1965, Nov. 18, 1965, 15907/65; 15909/65
Int. Cl. A61k *27/00*
U.S. Cl. 424—322 18 Claims

Substituted urea derivatives having useful antibacterial activity as well as starting materials for their production and methods for preparing the said starting materials; pharmaceutical compositions containing the subject urea derivatives as active ingredient and method for the production of tuberculostatic effects in mammals. An illustrative embodiment is 1-(1-adamantyl)-3-(3,4-dichloro-phenyl)-urea.

3,621,101

ANTIDEPRESSANT COMPOSITION AND METHOD OF TREATING DEPRESSION

Povl V. Petersen, Virum; Villy H. Hansen, Copenhagen, and Jes Hjortkjaer, Hvidovre, all of Denmark, assignors to Kefalas AIS, Copenhagen-Valby, Denmark

Continuation-in-part of application Ser. No. 580,206, Sept. 19, 1966, now Patent No. 3,505,404. This application Jan. 14, 1970, Ser. No. 2,928. Claims priority, application Great Britain, Oct. 10, 1965, 41849/65
Int. Cl. A61k *27/00*
U.S. Cl. 424—330 16 Claims

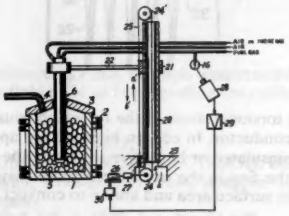
1-(Aminoalkyl)-1-phenylindanes and 1-(aminoalkyl)-1-phenyl-tetralines, and the corresponding acid addition salts thereof are prepared by reacting the corresponding 1-phenylindane or 1-phenyl-tetraline with an amino alkyl halide. The prepared compounds are useful for the treatment of endogenous depression in living animals and are administered as compositions comprising the active ingredient and a suitable pharmaceutical carrier.

ELECTRICAL

3,621,102
LOW-FREQUENCY INDUCTION FURNACE

Yukio Tanaka; Jun Mizushina; Hitoshi Yamagishi, and Hiroshi Kosaki, all of Tokyo, Japan, assignors to Kokusai Electric Company Limited, Tokyo, Japan

Filed Mar. 3, 1970, Ser. No. 16,096
Claims priority, application Japan, Mar. 7, 1969, Mar. 7, 1969, Oct. 22, 1969, 44/16791; 44/19966; 44/83857
U.S. Cl. 13—2 6 Claims

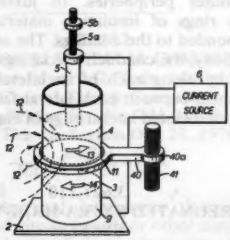


A low-frequency furnace comprising a crucible for receiving a batch of cold charge to be fused, an induction coil surrounding said crucible, a gas burner for movement into and out of said crucible and including three coaxially and peripherally spaced tubes for transporting fluids for combustion therethrough and an elevating means for said gas burner for moving the burner vertically relative to said crucible thereby to change the position of the burner relative to the surface of molten metal obtained by the fusing of said cold charge.

3,621,103
METHODS OF AND APPARATUS FOR STIRRING IMMISCIBLE CONDUCTIVE FLUIDS

John Campbell, Sheffield, England, assignor to The British Iron and Steel Research Association, London, England

Filed Jan 30, 1970, Ser. No. 7,085
Claims priority, application Great Britain, Feb. 17, 1969, 8,446/69
Int. Cl. H05b *3/60*
U.S. Cl. 13—9 12 Claims

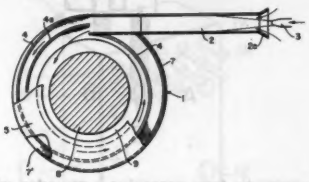


The invention relates to the stirring of mutually immiscible liquids which meet at an interface. An electric current is passed through the interface and oppositely directed magnetic field components are produced perpendicular to the direction of current flow in the fluids adjacent the interface. There thus result in the fluids adjacent the interface oppositely directed forces which produce stirring of the fluids.

3,621,104
SEALING DEVICE FOR ELECTRODE HOLES IN ELECTRIC ARC FURNACES

Alexander Yordanov Valchev, Sofia, and Kyril Hristov Tashev, Pernik, both of Bulgaria, assignors to DMZ Lenin, Pernik, Bulgaria

Filed Sept. 17, 1970, Ser. No. 73,204
Claims priority, application Bulgaria, Sept. 19, 1969, 13,046
Int. Cl. H05b *7/12*
U.S. Cl. 13—9 5 Claims

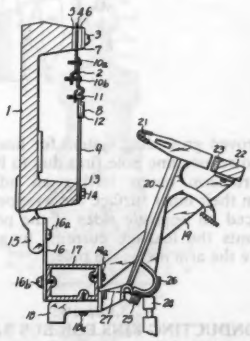


Sealing device for electrode holes in electric arc furnaces; the device includes means creating a chamber around the electrode, and means for creating in the chamber a gas pressure exceeding the pressure in the furnace space. A diffuser is placed in the access duct of the chamber and a nozzle is located in the axis of the diffuser, this nozzle delivering gas under pressure which entrains additional quantities of gas. Preferably the gas is air. The chamber of the sealing device may have two or more access ducts, diffusers being placed in all access ducts, and a nozzle being located in the axis of each diffuser, each such nozzle delivering gas under pressure. The cross section of the diffuser may have a reduced height and an increased width, and may be shaped as an oval, an ellipse, a rectangle, or another similar geometrical figure; there may be two or more nozzles located in the diffuser, such nozzles delivering gas under pressure.

3,621,105
ACTION DEVICE FOR ELECTRIC MUSICAL INSTRUMENT

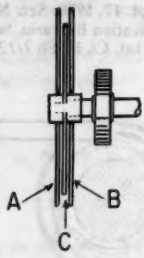
Naokichi Takamatsu, Hammamatsu, Japan, assignor to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.), Tokyo, Japan

Filed Oct. 6, 1970, Ser. No. 78,366
Claims priority, application Japan, Mar. 10, 1970, 45/20359
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.16 12 Claims



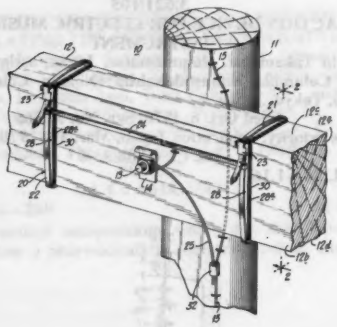
An action device for an electric musical instrument having a frame, an electrostatic type pickup mounted on the frame, a center rail fixed to the frame, a flange attached thereto, a hammer pivoted to the frame, and a hammer rail fixed to the center rail. In this case, the device is formed in such a manner that the electric charge stored on the hammer is grounded.

3,621,106
ELECTRONIC TONE GENERATOR
Javier Mugica Irastorzo, Alto de Aldaconea, San Sebastian, Guipuz coa, Spain
Filed Aug. 29, 1969, Ser. No. 854,125
Int. Cl. G10h 3/04
U.S. Cl. 84—1.28 4 Claims



An electrostatic tone generator is provided which includes at least one subelement having a rotary disk and a pair of adjacent stators. Each stator has concentrically arranged tonal patterns which are read by analyzers which are distributed in matching concentric areas. While the tonal patterns included on the matching stators are not symmetrical the analyzer arms for the outermost concentric tonal areas are symmetric and are identically sized and shaped.

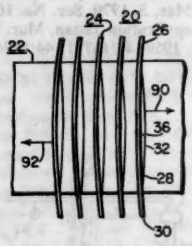
3,621,107
LINE POLE GROUNDING SYSTEM
William H. Duvendack, Butte, Mont., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.
Filed June 30, 1970, Ser. No. 51,221
Int. Cl. H02g 7/00; H01r 3/06
U.S. Cl. 174—6 5 Claims



An improved grounding system for line pole crossarms is provided to reduce line pole fires due to leakage currents. A pair of crossarm bands having an adhesive conductive material on their inner surface are wrapped around the crossarms spaced on opposite sides of the pole, and grounding means shunts the leakage currents to ground around the gains where the arm meets the pole.

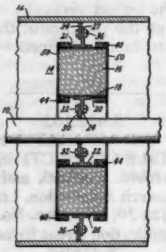
3,621,108
HEAT-CONDUCTING FINS FOR BUS BARS AND OTHER ELECTRICAL CONDUCTORS
Charles M. Cleaveland, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 21, 1970, Ser. No. 4,493
Int. Cl. H01b 7/34
U.S. Cl. 174—15 11 Claims

A plurality of heat-conducting fins disposed on various types of electrical conductors both insulated and uninsulated, and for both high- and low-voltage applications such as in bus bars, disconnect and knife switches, and circuit breakers. Each of said fins includes a central opening which is slightly smaller in one dimension than the conductor on which the fins are assembled and therefore must be distorted somewhat during assembly on the conductor. The distortion in each fin



develops a torsional stress in the fin which causes it to tightly grasp the conductor. In certain high-voltage applications, the fin may be insulated or bent over to reduce the effective radial size of the fins in the overall conductor assembly without reducing its surface area and ability to convect heat.

3,621,109
ELECTRICAL INSULATOR AND METHOD OF MAKING
Roy Nakata, Bryn Mawr, Pa., assignor to General Electric Company
Filed Dec. 4, 1970, Ser. No. 95,265
Int. Cl. H01b 9/04
U.S. Cl. 174—16 10 Claims

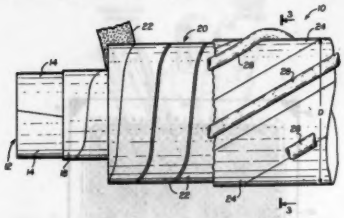


Discloses an electric insulator and a method of making same wherein an annular body of high dielectric constant insulating material is provided with conductive coatings on its inner and outer peripheries. In juxtaposition with the coatings are rings of insulating material that have their peripheries bonded to the coatings. The assembly comprising the annular body, the conductive coatings, and the insulating rings is ground along each of its lateral faces to produce precise flushness between each lateral face of the insulating body and the associated lateral edge of each conductive coating.

3,621,110
FIELD IMPREGNATED EXTRA-HIGH-VOLTAGE CABLE SYSTEM
Martin H. McGrath, New York, N.Y., assignor to General Cable Corporation, New York, N.Y.
Filed Apr. 1, 1969, Ser. No. 811,755
Int. Cl. H01b 9/06
U.S. Cl. 174—25 4 Claims

This electric cable uses a polymeric insulation in place of impregnated paper insulation to make possible underground transmission lines for high voltage. The cable is constructed for impregnation in the field and is filled, usually with oil, after installation in a pipe. The cable insulation is a fibrous paperlike sheet material of high-density polyethylene. Low friction of the insulation, when dry, permits bending around

smaller spools for shipping. The cable is free of cellulose material, or other substances that have a sponge effect when



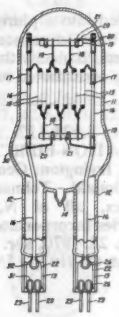
exposed to moisture, so that no high-temperature drying is required in the field prior to impregnating the cable.

3,621,111

LEAD-IN CONDUCTOR FOR ELECTRICAL DEVICES

George K. Danko, Chesterland, Ohio, assignor to General Electric Company

Filed July 1, 1970, Ser. No. 51,639
Int. Cl. H01j *5/38*
U.S. Cl. 174—50.64 **2 Claims**



A lead-in conductor and method of manufacture for use in electrical devices. The lead-in conductor comprises outer and inner lead wires, a foil and a tab material of a specific melting point such that the tab material melts to form a high-current-carrying joint between the lead wires and the foil.

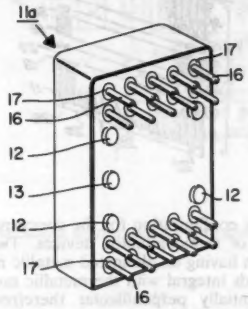
3,621,112

HOUSING FOR ELECTRICAL COMPONENTS

Beryl C. Stickley, and Edward G. Tutle, both of Waynesboro, Va., assignors to General Electric Company

Continuation of application Ser. No. 741,011, June 28, 1968, now abandoned. This application Oct. 28, 1970, Ser. No. 84,941
Int. Cl. H05k *5/06*
U.S. Cl. 174—50.52 **9 Claims**

A housing for electrical components that is suitable for mounting on printed circuit boards or other supporting members to be used in electrical-electronic equipment. The housing has a generally regular configuration (preferably rectangular), is enclosed on all sides, and preferably is fabricated from electrically conductive and ferromagnetic material. At least one surface of the housing (generally the bottom) has a plurality of housing supporting projections, preferably in the form of integral embossments, extending a predetermined distance for raising the housing above the surface of the printed circuit board or other supporting member a sufficient amount to provide for further processing or use such as to accommodate a cleaning or cooling flow of fluid. The projections are irregularly arrayed with respect to the sides of the housing and provide both tactile and visual indicators for facilitating proper alignment of the housing during placement on a printed circuit board or other supporting member. A plurality of electrically conductive leads extend through insulated openings in the bottom of the housing and are located at the intersections of an equally spaced grid system. The projections extending from the bottom of the housing are positioned so as to be located at selected spots corresponding to the intersections of the same equally spaced grid system that locates the electrically conductive leads. A greater number of the projections are formed on one side of the housing than are formed on the other in order to provide the



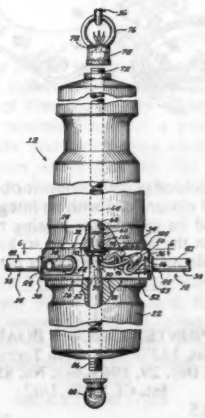
irregularity in the array of projections required to facilitate alignment of the component during placement on a printed circuit board or other supporting member. Grounding strips of conductive material may be attached to the sides of the housing and where so attached, are so positioned relative to the intersections of the same equally spaced grid system locating the electrically conductive leads and projections as to fit into a logical extension of the equally spaced grid system. The sides of the housing may be hermetically sealed closed to provide a protective environment for the electrical components contained therein.

3,621,113

CONNECTOR AND CONDUIT AND METHOD OF MANUFACTURE

Kenneth Westby, Fort Atkinson, Wis., assignor to Thomas Industries Inc., Fort Atkinson, Wis.

Filed Oct. 31, 1969, Ser. No. 872,861
Int. Cl. H02g *3/20*
U.S. Cl. 174—51 **22 Claims**



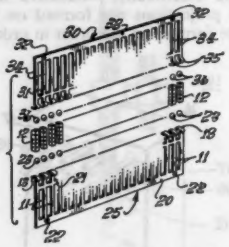
A tubular member adapted to serve as a conduit for electrical wiring and also adapted to serve as a structural element for securing together other structural elements, such as walls of a housing, or the like.

3,621,114

LEAD FRAME CONFIGURATION

Josef Ref, Los Angeles, and Mort Finhill, Palos Veedes Peninsula, both of Calif., assignors to TWR Semiconductors, Inc., Lawndale, Calif.

Filed Aug. 19, 1969, Ser. No. 851,304
Int. Cl. H05k 5/00
U.S. Cl. 174—52 PE 10 Claims



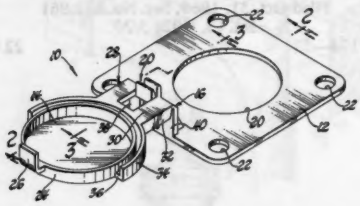
A lead frame configuration for the concurrent fabrication of a plurality of semiconductor devices. Two lead frame structures, each having an elongated metallic member with a plurality of leads integral with the metallic member and extending substantially perpendicular therefrom in parallel alignment, are axially opposed to one another. The leads of each frame structure are spaced substantially equidistant from each other, joined by an intermediate crossmember substantially parallel to the elongated metallic strip. The opposing ends of each lead frame have a resilient receiving member adapted for contacting a surface of a semiconductor device. The method includes the steps of bonding the semiconductor devices to the lead frames, encapsulating the semiconductor devices and severing the individual semiconductor devices from the completed structure.

3,621,115

CONNECTOR BOX COVER CONSTRUCTION

Wilhelm K. Kolster, deceased, late of Michigan City, Ind. (by Christel E. Kolster, executrix), assignor to Meridian Industries, Inc., Southfield, Mich.

Filed May 1, 1970, Ser. No. 33,556
Int. Cl. H05k 5/03
U.S. Cl. 174—67 7 Claims



A one-piece, molded plastic connector box cover including a cover plate and closure cap with an integral hinge provided therebetween and an overcenter biasing means formed and provided between the plate and cap to keep the cap closed when disposed relatively over the cover plate part.

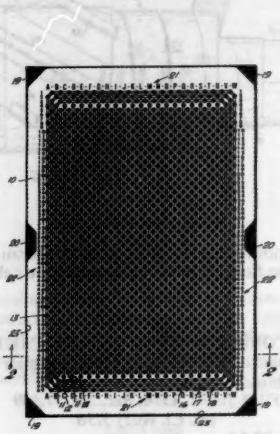
3,621,116

PRINTED CIRCUIT BOARD

Bertram C. Adams, 11370 S.W. 60th Terrace, Miami, Fla.

Filed Dec. 29, 1969, Ser. No. 888,303
Int. Cl. H05k 1/02
U.S. Cl. 174—68.5 2 Claims

A printed circuit board for multipurpose use having printed on one face a plurality of parallel circuit tracks each of which is provided along its length with a plurality of enlarged connection stations. The connection stations of the tracks are so placed along their respective tracks as to present a grid pattern along rectangular coordinates. A system of identification indicia printed transversely and vertically along the sides of the grid pattern serves to readily identify any one of the connection stations for easy use of the circuit board in circuit assembly. The track portions between



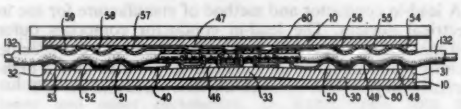
stations are each divided into a plurality of narrow, parallel subtracks to facilitate their severance for open-circuiting as may be necessary in accordance with the particular requirements of a circuit being constructed on the circuit board.

3,621,117

WRAPPED INSULATION-PIERCING CONNECTOR

Stanley Casimir Antas, Irvington; George Thomas Genneken, Whippany, and Donald Tolman Smith, Piscataway Township, Middlesex, all of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1970, Ser. No. 66,824
Int. Cl. H02g 15/08
U.S. Cl. 174—84 C 9 Claims



This connector consists of a shell, an insulation-piercing type insert, a leaf spring therebetween, and a plastic film bonded to the shell. A spring force on the insert maintains long term contact of the piercing tangs with the conductors. A crimping tool is disclosed having a die with a main-slot wire guide for all splice types. Wires to be severed are led to a branching slot where, during splicing, the shell edge severs conductors therein. Useful for telephone gauge conductors, this connector system requires no insulation stripback or special handling skills.

3,621,118

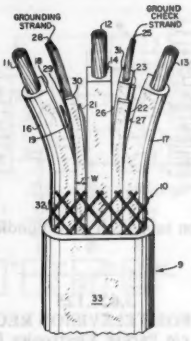
POWER CABLE FOR PORTABLE MACHINES

Steve Bunish; Floyd A. Wilson, and Theodore E. Hansen, all of Marion, Ind., assignors to Anaconda Wire and Cable Company

Filed July 31, 1970, Ser. No. 60,054
Int. Cl. H01b 7/00
U.S. Cl. 174—115 2 Claims

A flat three-phase power able comprises a heavy grounding strand and a smaller ground-check strand with the structural

balance of the cable and reliability of the ground-check strand assured by insulating the ground-check strand with a heavy sheath.



3,621,119

INSULATED CONDUCTOR FOR COMMUNICATION CABLE

Masao Sugiyama; Toshio Suzuki; Hajime Noda; Saburo Kashimura; Shozo Hato, and Hideo Tanaka, all of Hitachi-shi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Sept. 30, 1968, Ser. No. 763,612
Claims priority, application Japan, Oct. 4, 1967, Oct. 23, 1967, Oct. 23, 1967, 42/84078; 42/89409; 42/89410
Int. Cl. H01b *7/00*
U.S. Cl. 174—124 R **2 Claims**

A paper-insulated conductor for communication cables in which layers of insulating paper surrounding the conductor are bonded to each other or the insulating paper is bonded to the conductor by a bonding agent so that the insulated conductor can be inserted into an insertion connector without becoming loose, jointing work with a jointing tool can easily be carried out, and any short circuit will not occur between the conductors within the cable. The insulated conductor has excellent electrical properties in spite of the use of the bonding agent.

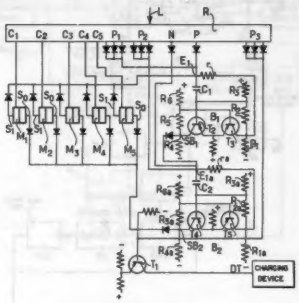
3,621,120

SYSTEM FOR AUTOMATICALLY CHARGING TELEGRAPHIC COMMUNICATIONS

Jean Demartres, Paris, and Roger Teurnier, Rueil-Malmaison, both of France, assignors to C.I.T.-Compagnie Industrielle Des Telecommunications, Paris, France

Filed Nov. 15, 1968, Ser. No. 776,026
Claims priority, application France, Nov. 15, 1967, 128385
Int. Cl. H04l *15/26*
U.S. Cl. 178—2 F **13 Claims**

The present invention relates to a system for automatically charging telegraphic communications which permits the charging to start in the caller's office only on reception of two items of information, one of which is the international call-connected signal emitted by the receiving office, while the other is a combination of the international code No. 2, said system comprising a first device for identifying the call-connected signal and a second device for ordering the charging.

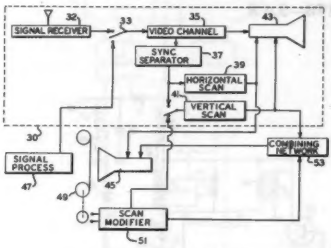


3,621,121

CONTINUOUS ELECTRONIC FILM SCANNER

Robert Roy Eckenbrecht, East Bethany, N.Y., and Benton Boyd Scott, Tempe, Ariz., assignors to GTE Sylvania Incorporated

Filed Feb. 13, 1970, Ser. No. 11,171
Int. Cl. H04n *9/02, 5/86*
U.S. Cl. 178—5.2 D **10 Claims**



In a visual image display system, apparatus is included for deriving electrical signals representative of image information from a film of film frames, for transporting the film frames through a scanning zone at a predetermined film frame repetition rate, and for effecting continuous modification of electron beam scanning of the film frames at a rate substantially equal to the repetitive rate of film frame movement through the scanning zone.

3,621,122

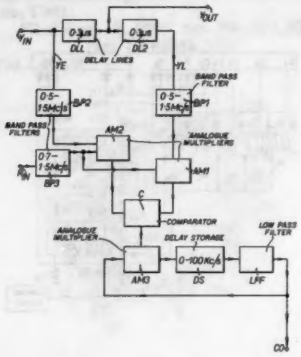
COLOR TELEVISION CAMERAS

William Ernest Henry Hipwell, Wickford, England, assignor to The Marconi Company Limited, London, England

Filed July 31, 1969, Ser. No. 846,399
Claims priority, application Great Britain, Aug. 13, 1966, 38,701/68
Int. Cl. H04n *5/26*
U.S. Cl. 178—5.4 M **21 Claims**

In a component camera tube color television camera registration is effected by comparing changes in the output signals from one component camera tube with changes in the output of another and using the result of the comparison to correct for registration errors. The output signals from one tube may

be subjected to two equal successive delays and the undelayed and doubly delayed signals each analogue multiplied



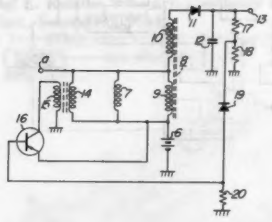
by the output signals from the other tube, the results of the multiplication being compared.

3,621,123

HIGH-VOLTAGE REGULATION CIRCUIT FOR A COLOR TELEVISION RECEIVER

Ryoichi Hirota, Yokohama; Tohru Fujishima, Yokohama; Gentaro Miyazaki, Fujisawa; Tadahiko Iwasaki, Kamakura; Mitsuharu Akatsu, Yokohama, and Tomoo Kinoshita, Yokohama; all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 19, 1970, Ser. No. 38,690
Claims priority, application Japan, May 20, 1969, 44/39094
Int. Cl. H04n *9/12, 3/18*
U.S. Cl. 178—5.4 R **21 Claims**



A high-voltage regulation circuit for a color television receiver comprising a dummy coil which is equivalent to a horizontal deflection coil a high-voltage circuit and a variable inductance element connected in parallel with said dummy coil, thereby controlling the inductance of said variable inductance element in response to the variation of a high voltage of the high-voltage circuit.

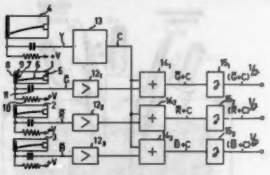
3,621,124

TELEVISION CAMERA

Sing Liong Tan, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 6, 1969, Ser. No. 796,987
Claims priority, application Netherlands, Feb. 8, 1968, 6801742
Int. Cl. H04n *9/08*
U.S. Cl. 178—5.4 TC **7 Claims**

A camera circuit features at least two camera tubes, one of which has a larger effective target plate capacitance, hence produces a higher resolution signal, than the other tube. The high-resolution signal is applied to an aperture correction circuit and then to the low-resolution signal to correct for the "comet tail" effect. To obtain the high-target plate capacitance effect, the target plate can be made larger, or



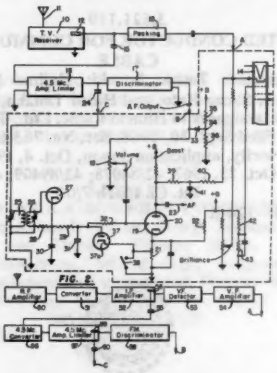
the lower resolution tubes can have bundles of optical fibers in front of them.

3,621,125

MUTER FOR TELEVISION RECEIVERS

Louis W. Parker, c/o Parker Electronics Inc. 2040 N. Dixie Highway, Fort Lauderdale, Fla.

Continuation-in-part of application Ser. No. 785,494, Dec. 20, 1968, now abandoned. This application Oct. 5, 1970, Ser. No. 77,831
Int. Cl. H04n *5/62*
U.S. Cl. 178—5.8 **12 Claims**



An intercarrier television receiver is provided with an audio amplifier normally biased beyond cutoff. A tuned circuit, separate from the intercarrier sound system of the receiver, is sharply tuned to the intercarrier frequency for selectively producing a control signal operative to unlock the audio amplifier. Limiters are provided to prevent unlocking of the audio amplifier in response to excessive noise pulses, and to maintain the control signal at a steady value regardless of changes in amplitude of the received signal.

3,621,126

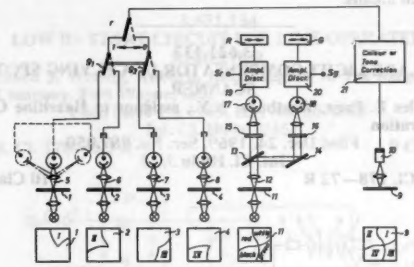
METHOD FOR ELECTRONICALLY COPYING PARTS OF DIFFERENT PICTURE ORIGINALS

Heinz Taudt, Kiel, and Hans Keller, Molfsee, both of Germany, assignors to Rudolf Hell Kommanditgesellschaft, Kiel-Dietrichsdorf, Germany

Filed Mar. 16, 1968, Ser. No. 713,490
Claims priority, application Germany, Mar. 17, 1967, H 62 168
Int. Cl. H04n *1/38, 5/22*
U.S. Cl. 178—6 **6 Claims**

This invention is directed to method of electronically copying parts of different picture originals. The originals are photoelectrically scanned by a light beam while simultaneously scanning a mask. The scanning of the originals and the mask occur synchronously and in register with one another. Picture signals and mask signals are developed during the scanning operation, and the mask signals are split into a plurality of transducers which are sensitive to different spectral

regions of each mask color to produce characteristic mask signals. The picture signals are then connected to recording devices for reproduction in accordance with the mask signals produced.

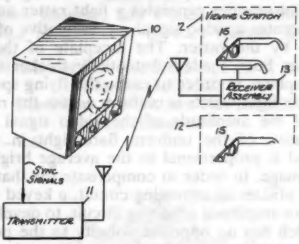


3,621,127

SYNCHRONIZED STEREOSCOPIC SYSTEM

Karl Hope, P.O. Box 184, E. Stroudsburg, Pa.

Filed Feb. 13, 1969, Ser. No. 798,981
Int. Cl. G03b *35/02, 35/16;* **H04n** *9/54*
U.S. Cl. 178—6.5 **5 Claims**



A stereoscopic system wherein two displaced images of a scene are projected sequentially on a viewing screen such that right and left images are alternately presented for equal times. The projection device is adapted to generate sync signals indicating the points in time at which the images are alternately presented. The sync signals modulate a high-frequency carrier which is emitted in the viewing area and is intercepted by receivers at portable viewing stations. Each observer is furnished with a viewing station which includes a shuttering spectacle having left and right eye elements that open and close alternately at a rate and in a phase controlled by the sync signals, whereby viewing of the displaced images is coordinated with the shuttering action.

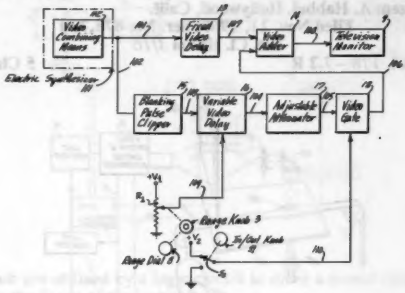
3,621,128

PERISCOPE STADIMETER SIMULATOR WITH VIDEO DELAY

Carl R. Driskell, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 1, 1970, Ser. No. 24,750
Int. Cl. H04n *5/22, 7/18*
U.S. Cl. 178—6.8 **8 Claims**

Apparatus for use in an electronic periscope view simulator training device for electronically simulating periscope stadimeter operation.

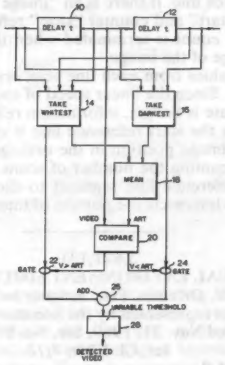


3,621,129

DETECTION DEVICES FOR IMAGE ANALYSIS SYSTEMS

Colin Fisher, Meldreth, Royston, England, assignor to Metals Research Limited, Melbourn, Royston, England

Filed Apr. 30, 1969, Ser. No. 820,532
Claims priority, application Great Britain, May 1, 1968, 20,612/68
Int. Cl. H04n *7/02*
U.S. Cl. 178—6.8 **17 Claims**



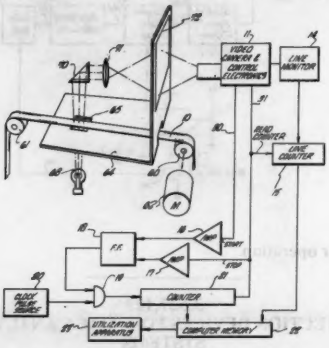
Detection devices for image analysis systems employing line scanning in which detection is in part governed by inspecting video signal from portions of scan lines intersecting a feature under analysis other than that currently being scanned.

In one device a reference level voltage for threshold detection is generated by generating mean of the whitest and blackest signal levels of image portions immediately before and after that currently under analysis so that the reference threshold is constantly equated to the black and white content of the image under analysis.

In another device the inspection of image portions before and after that currently under analysis allow a decision to be made as to whether the current portion is inside or outside a feature defined only by a boundary having an unsymmetrical density profile.

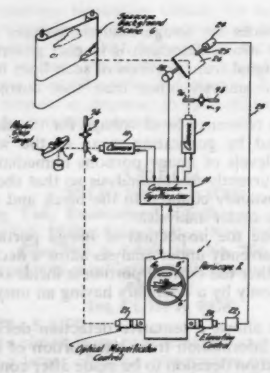
Another system allows a tentative detection decision to be made from the information from one portion of a line scan and a final detection decision to be made after comparing the provisional decision with a later decision based on information from preceding and following line scanned portions relative to that on which the tentative decision was made.

3,621,130
SYSTEM FOR QUANTIZING GRAPHIC DISPLAYS
T. O. Paine, Administration of the National Aeronautics and Space Administration with respect to an invention of, Nazem A. Habbal, Hollywood, Calif.
Filed Nov. 21, 1969, Ser. No. 878,730
Int. Cl. H04m 3/16
U.S. Cl. 178—7.2 R 5 Claims



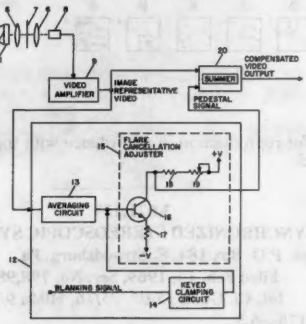
A system for digitizing a graphic display to determine the position and orientation of objects depicted thereon is disclosed. The display is provided with a reference coordinate framework. A detection apparatus scans the display in a line-by-line manner. A counter is initiated when each line scan intersects a first reference line of the coordinate framework and normally continues to count until the scan intersects a second reference line. If there is an "image" portion between the counter "start" and counter "stop" reference lines, however, then the count is terminated when the scan intersects the leading edge of the image.
The counter values from each line scan are stored in a computer memory. Since the linear speed of each scan relative to the counting rate is known, information relating to the image distance above the start reference line is obtained. Information as to the image position in the orthogonal coordinate is obtained by counting the number of scans of known separation from a reference line segment to the point where the reference scan intersects the portion of interest.

3,621,131
VISUAL ENVIRONMENT SIMULATOR
Hanns H. Wolff, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy
Filed Nov. 21, 1969, Ser. No. 878,697
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 5 Claims



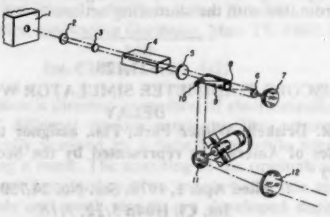
In an electronic synthesizer used in a periscope simulator training device wherein a composite picture of movable targets and a background scene is synthesized on a television display, electrically or mechanically operated optical means are used to shift the area on the background scene observed by a background camera. Means are provided to synchronize the electronic target moving means with the movement of the optical means.

3,621,132
FLARE LIGHT COMPENSATOR IN A FLYING SPOT SCANNER
Charles E. Page, Westbury, N.Y., assignor to Hazeltine Corporation
Filed Dec. 24, 1969, Ser. No. 887,850
Int. Cl. H04n 3/16
U.S. Cl. 178—72 R 10 Claims



Disclosed is apparatus for compensating for the effects of flare light in an electrooptical image scanning system wherein a flying spot scanner generates a light raster and a light detector generates a video signal representative of an image illuminated by the raster. The faceplate of the flying spot scanner has been made substantially thicker than conventional faceplates in order to cause the flying spot scanner to emit a flare light which is uniform across the raster area. A portion of the amplitude of the video signal generated is representative of the uniform flare light in the scanning system and is proportional to the average brightness of the scanned image. In order to compensate for that portion, the apparatus utilizes an averaging circuit, a keyed clamping circuit, and an amplitude adjusting circuit, to develop a pedestal signal which has an opposite polarity to the polarity of the video signal and an amplitude approximately equal to the portion of the amplitude of the video signal caused by uniform flare light. The pedestal signal and the video signal are then combined by a summing circuit in order to cause their amplitudes to be effectively subtracted thereby producing a compensated output video signal which is substantially free from the effects of flare light.

3,621,133
LASER DISPLAY
Charles E. Baker, and Bob E. Martel, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 439,857, Mar. 15, 1965, Pat. No. 3,549,800.
Filed Oct. 30, 1967, Ser. No. 678,965
Int. Cl. H04n 3/08, 9/14
U.S. Cl. 178—7.3 5 Claims



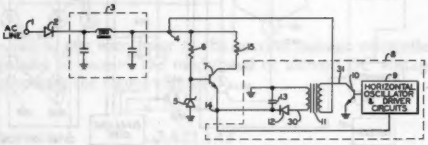
A laser display system is disclosed for displaying real time data by modulating a light beam from a laser, converting the

beam of light to a curved path of light and transforming the path light into successive straight lines. The straight lines of video information are then projected into a spaced relation to one another to form a display.

3,621,134
LOW B+ START CIRCUIT FOR LINE-OPERATED RECEIVER

Richard J. Waring, Auburn, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 17, 1969, Ser. No. 807,763
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.3 R **9 Claims**

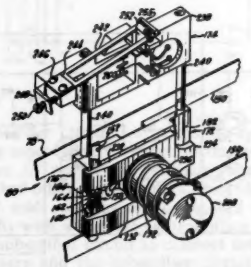


A switching transistor is provided for a solid-state line-operated television receiver which allows the low B+ voltage requirements of the receiver to initially be supplied from the high B+ through the turned-on switch transistor and subsequently on switching of the transistor to its nonconductive state, the low B+ requirements of the receiver are met by rectifying the horizontal flyback transformer voltage pulse.

3,621,135
FACSIMILE OPTICAL SCANNER AND LIGHTING MEANS

Frans Brouwer, Glencoe, and Frank L. Sobchak, Chicago, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Division of Ser. No. 613,545, Feb. 2, 1967, Pat. No. 3,527,882.
Filed Dec. 1, 1969, Ser. No. 881,055
Int. Cl. H04n *1/24*
U.S. Cl. 178—7.6 **6 Claims**



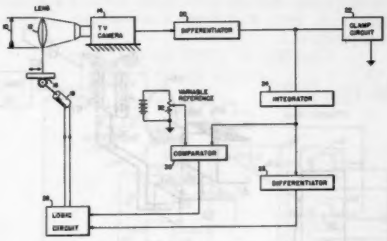
A facsimile transceiver including three optical scanners each of which carries its own light source for illuminating the copy as it is scanned. Also included are means for adjusting the optical axes of the scanners with respect to each other and printer contact means mounted on each scanner for marking recording paper when operating in the receiver mode.

3,621,136
AUTOMATIC OPTICAL-FOCUSING SYSTEM FOR TV CAMERAS

Robert K. Stanwood, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 10, 1969, Ser. No. 856,760
Int. Cl. H04m *5/00*
U.S. Cl. 178—7.92 **8 Claims**

Apparatus for automatically focusing a television camera. The video signal output of the camera is successively differentiated, integrated and differentiated to produce signals

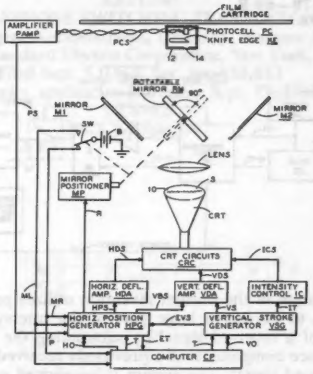


which are utilized by a logic circuit to drive a motor that controls the focus of the camera.

3,621,137
WIDE-SPAN PATTERN GENERATOR

Solomon Manber, Sands Point, N.Y., assignor to Alphanumeric Incorporated, Lake Success, N.Y.

Filed Mar. 28, 1969, Ser. No. 811,474
Int. Cl. H04l *15/34*
U.S. Cl. 178—15 **11 Claims**



A method and apparatus for positioning at least one terminal point of the scan of a medium by a beam is disclosed. The beam is moved in the direction of the scan from one point past a fiducial point having a known position with respect to the medium. There is registered a quantity related to the distance the beam moved from one point to the fiducial point. Thereafter, during scans of the medium, the one terminal point is shifted along the direction of the scan by a distance related to the registered quantity.

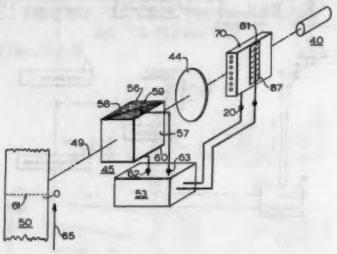
3,621,138
ALPHANUMERIC CHARACTER RECORDING APPARATUS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.

Filed Dec. 17, 1969, Ser. No. 885,889
Int. Cl. H04l *15/34*
U.S. Cl. 178—15 **3 Claims**

An apparatus utilizing a character generation control system between a source of light and a light-responsive record medium for recording information in the form of letters, numerals, symbols, etc., which must be recorded in well-registered lines of type fonts across the medium. This is accomplished through the use of a vertical array of individually controlled light beams that are swept simultaneously in a horizontal direction across the surface of the record medium. While doing so the beams of the array are selectively turned on or off in accordance with a predetermined set of character generation requirements. Electrooptic light gating elements are associated with an array of light guides, from

which the beams emanate, for effecting the desired on-off conditions for generating a line of characters, and electroop-

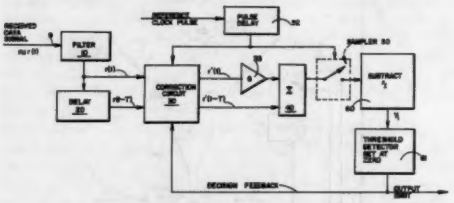


tic light beam deflectors are used to direct the beams to a series of horizontal line positions on the medium.

3,621,139
DATA RECEIVER WITH INTERSYMBOL INTERFERENCE CORRECTION

Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation

Filed May 11, 1970, Ser. No. 36,151
Int. Cl. H04l *25/02*
U.S. Cl. 178—69 B **7 Claims**



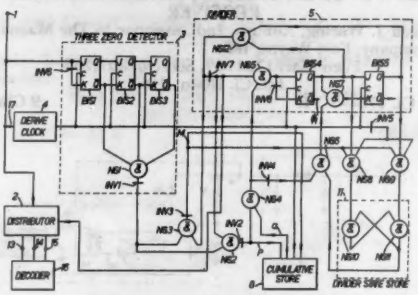
The system of the present invention utilizes previous digit decisions to correct a large part of the intersymbol interference of a received signal by subtracting the intersymbol interference components of a previously received signal from the received signal. The system is comprised of means for delaying an input digital data signal having intersymbol interference components. A correction means receives the nondelayed and the delayed signal along with a corrected system output signal which is fed back to the correcting means from the system's output. The correcting means generates from the corrected system's output signal a new signal containing all bits normally associated with the output signal when it was first received and wherein the generated intersymbol interference signals are subtracted from the delayed and nondelayed input signals to provide corrected signals. The nondelayed signal is fed to an amplifier with a predetermined gain setting. The output from the amplifier and the delayed output from the correction means are summed together in a summing means. A sampler samples the summing means output at substantially the data bit rate. A threshold detector detects the level of the sampled signal to provide the corrected system's output signal.

3,621,140
APPARATUS FOR ALIGNING WORD INTERVAL SIGNALS WITH THE WORD FRAME OF RECEIVED DIGITAL DATA

John Michael Griffiths, Hillingdon, England, assignor to The Post Office, London, England

Filed Oct. 20, 1969, Ser. No. 867,770
Claims priority, application Great Britain, Oct. 28, 1968, 51072/68
Int. Cl. H04l *7/06*
U.S. Cl. 178—69.5 R **6 Claims**

The invention relates to a PCM synchronization system. The receiver generates a frame interval signal which identifies the length of frame within the transmitted serial digital data. Synchronization is produced by aligning the frame interval signals with a word framework of the received serial digital data. The detection of a forbidden data format within a frame indicates loss of synchronization between the trans-

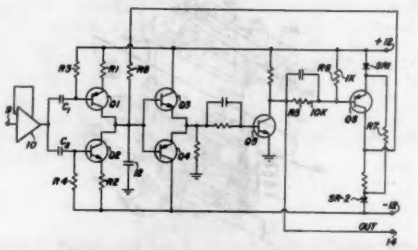


mitter and receiver. A cumulative store activates a phase correction mechanism for shifting the phase of a clock located at the receiver when the cumulative store reaches a numerical state which indicates the detection of the loss of synchronization above a threshold rate.

3,621,141
DICODE DECODER

Donald E. Mack, West Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 17, 1964, Ser. No. 419,156
Int. Cl. H04l *25/04*
U.S. Cl. 178—88 **7 Claims**



A decoder circuit for a dicode, or three-level signal. The circuit integrates a received diode signal to make a black-white decision based on one-half the normal input pulse energy. Once a decision has been made, a feedback circuit is activated which keeps the decision in its current circuit, until sufficient energy appears to force the decoder into the opposite state.

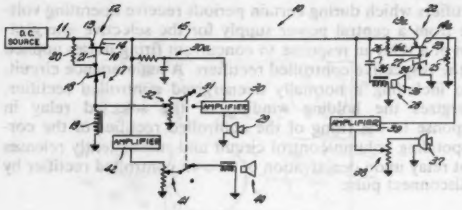
3,621,142
SINGLE WIRE DC COMMUNICATING MEANS

Earl L. Bunting, Westport, Conn., assignor to Bunting SteriSystems, Inc., Bridgeport, Conn.

Filed June 5, 1969, Ser. No. 830,756
Int. Cl. H04m *9/100*
U.S. Cl. 179—1 H **4 Claims**

Means for communicating over a single-wire DC circuit disposed between two voltage controllers or regulators

wherein the output of a first controller or regulator is altered or modulated by an impressed signal voltage and a receiver is



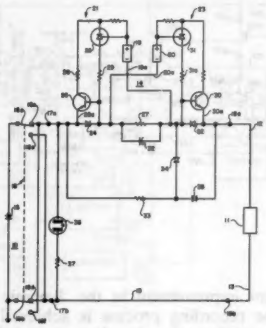
connected to the wire prior to the second voltage controller or regulator to receive the modulated or altered DC voltage and reproduce the signal voltage.

3,621,143

CURRENT-CONTROLLED VOLTAGE BOOSTER FOR TELEPHONE SYSTEMS

Charles William Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation

Filed Apr. 4, 1969, Ser. No. 813,611
Int. Cl. H04n *7/04*
U.S. Cl. 179—16 F **12 Claims**



A voltage booster circuit for telephone systems utilizing reverse battery supervision. First and second switches control the connection of respective auxiliary sources in series between a central office battery and a subscriber circuit. The conduction of said switches are controlled in accordance with the polarity with which the central office battery is connected to the subscriber circuit to connect between the central office battery and the subscriber circuit that auxiliary source which is in power-aiding relationship to the central office battery. The conduction period of one of the switches is made to predominate over the conduction period of the other during dialing and ringing so as to facilitate the transmission of dial pulses and the generation of a DC boost for energizing a trip relay during ringing.

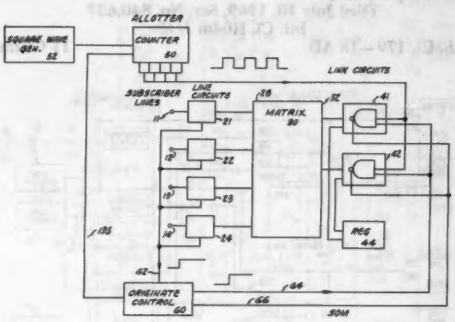
3,621,144

CALL-ORIGINATING CONTROL FOR ELECTRONIC TELEPHONE SYSTEMS

Nikola L. Jovic, Chicago, and Timothy J. Keough, Woodridge, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,890
Int. Cl. H04q *3/18*
U.S. Cl. 179—18 FG **8 Claims**

The system shown covers the portion of an electronic, end-marking switching network which responds to the condition of subscriber requesting service (off-hook condition) by connecting his line to an available link circuit. The request for service is coordinated with the marking of the output end of the matrix (link circuit end) to thereafter mark the input end



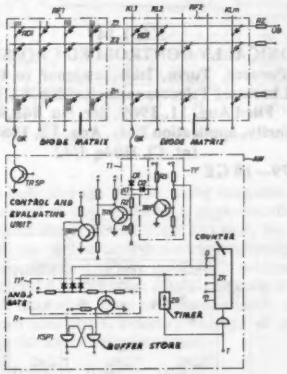
of the matrix to implement the connection through the "self-seeking," end-marked matrix.

3,621,145

TELEPHONE SWITCHING TRANSLATOR

Willi Verstegen, Kornwestheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,612
Claims priority, application Germany, Sept. 19, 1968, P 17 62 896.5
Int. Cl. H04q *3/47*
U.S. Cl. 179—18 ET **2 Claims**

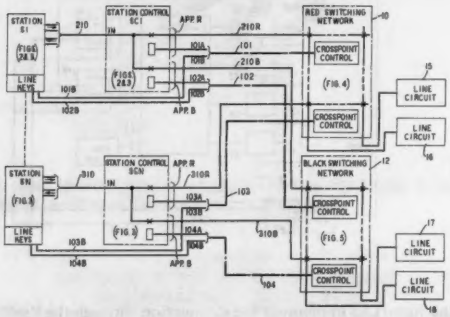


Gate circuits are allocated to the evaluating circuits in the evaluating translator unit. These gate circuits are provided with current via low-resistance secondary paths before evaluation. The gates circuits are connected to the outputs of a counting chain adapted to block the low-resistance secondary paths of the gate circuits, individually in succession, for the purposes of evaluation. The interrogation of the translator outputs involves no significant new building up processes, since only one translator output loads the corresponding row resistor at a time. Further gate circuits are assigned to the evaluating circuits. The pulse responsible for indexing the counting chain is fed, via a time-lag component, to these gate circuits. This measure ensures that no invalid output information is indicated during the short period before the occurrence of blocking.

3,621,146
KEY TELEPHONE STATION HAVING MULTINETWORK ACCESS

Charles E. Morse, and John P. Smith, both of Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 10, 1969, Ser. No. 840,637
Int. Cl. H04m 3/38
U.S. Cl. 179—18 AD 11 Claims

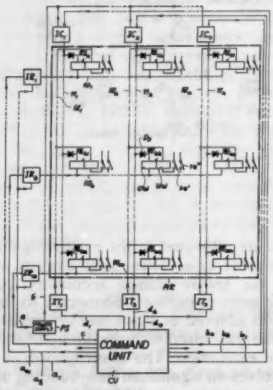


A key telephone system is arranged to provide access to both secure and nonsecure lines while, at the same time, maintaining the degree of isolation between the lines required of secure communication facilities. Each key station is selectively connected to the nonsecure lines through one switching network while connections to secure lines are made through a separate switching network. A station control circuit associated with each key station provides access for that station to either one of the switching networks. The operation of a line key at any station enables the switching network serving that line so as to cause the establishment of a transmission path from the enabling station through the control circuit to the enabled network.

3,621,147
ELECTRONICALLY CONTROLLED CROSSBAR SWITCH

Giovanni Perucca, Turin, Italy, assignor to CSELT Centro Studi e Lboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Aug. 11, 1969, Ser. No. 848,977
Claims priority, application Italy, Aug. 13, 1968, 52824-A/68
Int. Cl. H04q 3/42
U.S. Cl. 179—18 GE 12 Claims

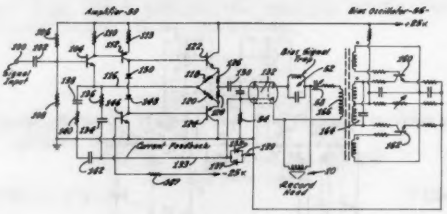


A crossbar switch for a telecommunication system has relays with operating windings and holding windings positioned at the junctions of "horizontal" and "vertical" conductors individual to respective rows and columns, the operating windings of all relays of one row being connected at one end to a common row-control circuit and at their other ends to individual column-control circuits by way of these conductors. The two control circuits include controlled rectifiers which during certain periods receive operating voltage from a central power supply for the selective energization of a relay in response to concurrent firing pulses applied to the respective controlled rectifiers. A maintenance circuit, also including a normally deenergized controlled rectifier, energizes the holding winding of the selected relay in response to the firing of the controlled rectifier of the corresponding column-control circuit and subsequently releases that relay upon deactivation of its own controlled rectifier by a disconnect pulse.

3,621,148
ELECTROMAGNETIC RECORD HEAD TRANSDUCER AND SYSTEM

Keith O. Johnson, Topanga Canyon, Calif., assignor to MCA Technology, Inc., Santa Monica, Calif.

Continuation-in-part of application Ser. No. 454,433, May 10, 1965, now abandoned. This application Sept. 9, 1968, Ser. No. 758,213
Int. Cl. G11b 5/24, 5/44
U.S. Cl. 179—100.2 K 2 Claims



A significant improvement in the dynamic range of the magnetic tape recording process is achieved by the electromagnetic transducer head and system of the present invention. This is achieved by providing a record head with a very high bias flux gradient in its gap, and with a significantly lower intelligence signal flux gradient. The record head gap has a nonmagnetic electrically conductive member therein which is insulated from the core material, and which provides the desired steep gradient for the bias flux. The record head is used in conjunction with an oscillator for supplying a bias signal of frequency of at least 1 MHz. and a record amplifier including circuitry for emphasizing the amplitude of high amplitude signals so as to compensate for magnetic saturation effects in the tape.

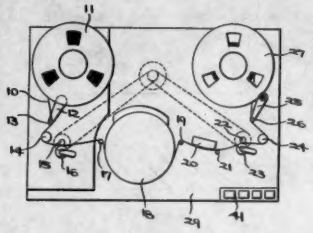
3,621,149
MAGNETIC TAPE TENSION CONTROL SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS HAVING DUAL CAPSTANS

Yoshiyo Wada, and Katsuya Yasutake, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokahama, Japan

Filed Aug. 12, 1969, Ser. No. 849,433
Claims priority, application Japan, Aug. 13, 1968, 43/57114
Int. Cl. G11b 15/43; B65h 59/38
U.S. Cl. 179—100.2 S 5 Claims

A magnetic tape tension control system is shown for magnetic recording and reproducing apparatus of the so-called double capstan type in which a magnetic tape is moved by two capstans driven by a single motor through belts. The control system keeps a constant tension on the portion of the magnetic tape which is between the two capstans irrespective

of the direction in which the tape is moved. This is done by varying the tension of the tape on the takeup reel side or supply reel side depending on whether the tape is moved in a normal direction or a reverse direction.

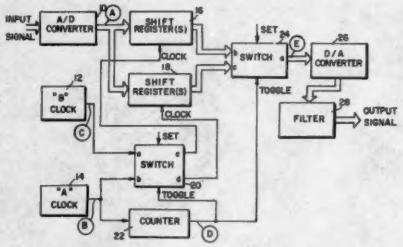


3,621,150

SPEECH PROCESSOR FOR CHANGING VOICE PITCH

George W. Pappas, Lyndeborough, assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sept. 17, 1969, Ser. No. 858,623
Int. Cl. G11b 5/02, 27/10
U.S. Cl. 179—100.2 K 21 Claims



By utilizing the speech processor of the invention, the speech of a diver in a helium-oxygen atmosphere is made intelligible, or a normal recording played at higher speeds is made intelligible thereby providing a speed hearing capability, or a voice signal is compressed for transmission over low bandwidth communication lines. The invention makes use of the fact that normal speech may be chopped or segmented at certain rates and still retain its intelligibility. The basic principle of the invention is accomplished in either an electronic or electromechanical embodiment wherein the following steps are performed. The speech to be processed is segmented into very small and, in some applications, equal pieces. Every other piece is discarded and the remaining pieces are recombined. The recombined pieces are played back at a slower speed dependent on the length of the discarded pieces.

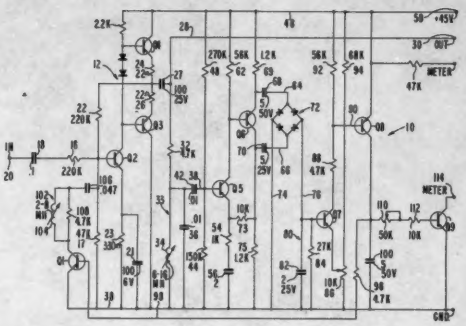
3,621,151

FREQUENCY SELECTIVE AUDIO LIMITER

James B. Wood, San Jose, Calif., assignor to GRT Corporation, Sunnyvale, Calif.

Filed Oct. 15, 1969, Ser. No. 866,545
Int. Cl. H03g 5/28
U.S. Cl. 179—100.2 R 12 Claims

A device for limiting the higher frequency energy of an audiofrequency spectrum being delivered to a magnetic tape recording device in which the full spectrum is amplified and the output of the amplifier is sensed to determine when the higher frequency energy is above a predetermined limit to provide a feedback signal which operates a shunt in the amplifying circuit to attenuate only the higher frequencies of the audiofrequency spectrum to maintain the higher frequencies at the output of the amplifier at a point below a predetermined level.

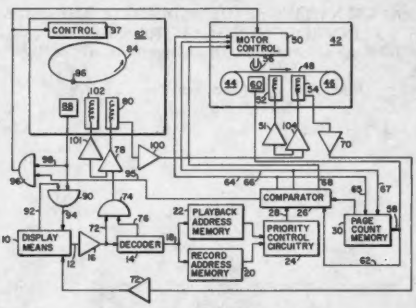


3,621,152

MAGNETIC TAPE STORAGE DEVICE

Philip M. Billings, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, NH

Filed Nov. 25, 1969, Ser. No. 879,644
Int. Cl. G11b 5/00
U.S. Cl. 179—100.2 S 11 Claims



A fast access bulk storage device, using magnetic tape, for storage and retrieval of data includes a page-counting circuit which samples and stores actual page location, by detecting translucent portions on the tape denoting beginning of page, and constantly compares it to any given page address entered into the system, and a data buffer stage, comprised of a continuous loop of magnetic tape of approximately one page length, which provides for temporary storage of data while the main storage device is being accessed.

3,621,153

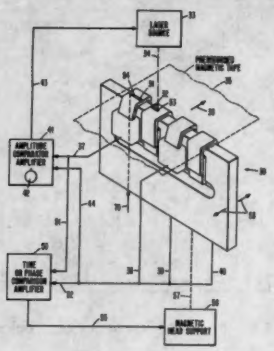
MAGNETIC READ/WRITE HEAD WITH PARTIAL GAP AND METHOD OF MAKING

John W. Wenner, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,147
Int. Cl. G11b 5/28, 5/24, 5/42
U.S. Cl. 179—100.2 C 10 Claims

A magnetic head having a plurality of read/write tracks, each track being formed of a single continuous lamina of high-permeability magnetic material which is wrapped around the edge of a support substrate and extends through an opening in the substrate. A coil encircles one leg of each of the lamina, the coils being alternately placed on opposite sides of the substrate to allow minimum space between the tracks. A magnetic gap extends less than the complete distance across each individual lamina parallel to the edge of the substrate.

The electrical characteristics of each individual magnetic gap are monitored as the gap is cut. The cutting operation is terminated in accordance with the value of an electrical characteristic to obtain uniform gap characteristics for each of the gaps. The lateral position of the cut is adjusted in accordance with the value of an electrical characteristic to obtain longitudinal alignment of all of the gaps.

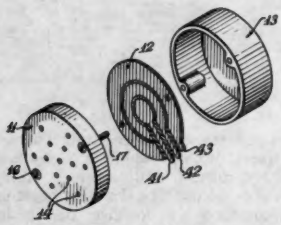


3,621,154

STRAIN-SENSITIVE SEMICONDUCTIVE THIN FILM ELECTROACOUSTICAL TRANSDUCER

James H. Kogen, Evanston, Ill., assignor to Shure Brothers Inc.

Filed Apr. 15, 1968, Ser. No. 721,309
Int. Cl. H04r *23/00*
U.S. Cl. 179—110 B **7 Claims**



A transducer for converting low-level pressure variations (such as sound waves) into electrical signal variations. A strain-sensitive coating is applied to selected surface regions on a flexible diaphragm substrate. A conductive coating is also applied to the substrate flanking the strain-sensitive coating to provide electrical connections for the transducer. Sensitivity of the transducer is enhanced by placing the strain-sensitive coating at points of maximum bending on the diaphragm. The transducer may also include an integrally formed "transistor" to provide an active source of signal gain.

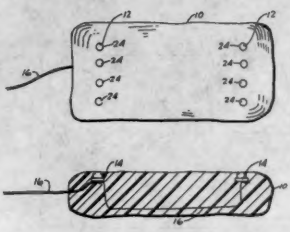
3,621,155

STEREO PILLOW

Jackson L. Pruitt, Print Shop, Box 15, U.S. Naval Station, FPO, New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,926
Int. Cl. H04m *1/11*
U.S. Cl. 179—146 H **1 Claim**

A pillow containing a plurality of loud speakers divided into two groups and electrically connected to stereo equipment whereby each group reproduces a corresponding channel.

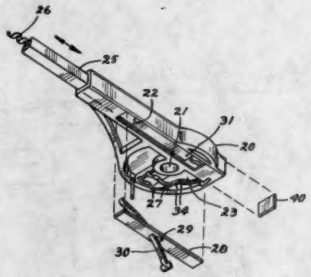


3,621,156

MICROPHONE BOOM

Donald L. Kliewer, Minneapolis, Minn., assignor to The Telex Corporation, Tulsa, Okla.

Filed May 26, 1969, Ser. No. 827,516
Int. Cl. H04m *1/04*
U.S. Cl. 179—150 **5 Claims**



A boom for adjustably mounting a microphone in proximity to the mouth of an operator. A housing is rotatably disposed on a headphone and includes internally disposed commutators which are operable to provide a switching and slidable contacting function. A boom member is slidably disposed in a laterally extending aperture in the housing and includes an internally disposed extendable conductor that is conductively connected to the commutators and to a microphone that is rotatably mounted on the remote end of the boom.

3,621,157

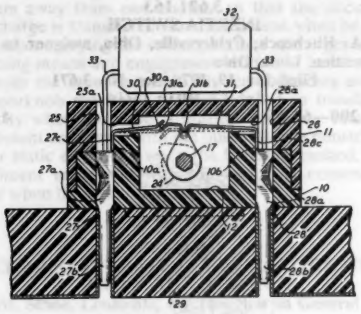
MINIATURE SWITCH WITH MULTIPLE CAM-OPERATED SWITCH CONTACTS

Pierre P. Schwab, River Edge, N.J., assignor to McGraw-Edison Company, Elgin, Ill.

Filed June 1, 1970, Ser. No. 42,032
Int. Cl. H01h *19/00;* **H05k** *7/10*
U.S. Cl. 200—6 BB **4 Claims**

A miniature switch designed for plug-in connection with printed circuit cards of standard integrated circuit systems comprises a shallow rectangular insulated case provided with a series of cantilever switch arms operable closed selectively by a common camshaft disposed at right angles to the direction of plug-in. The contact portions of the switch arms are oblique to their direction of actuation so that a rubbing contact is obtained as they are closed and opened. The switch arms extend from connector bodies which have pro-

jecting pins at one side of the case for plug-in connection with a terminal board, and have openings accessible from the



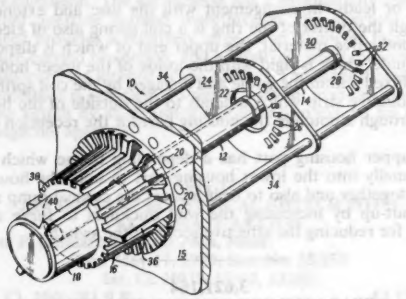
other side of the case for receiving plug-in pins of any other circuit components of the system.

3,621,158

ELECTRICAL SWITCHING APPARATUS

Nicholas Darryl Swinstead, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Oct. 16, 1970, Ser. No. 81,215
Claims priority, application Great Britain, Oct. 20, 1969, 51,408/69
Int. Cl. H01h *19/58, 27/10, 3/02*
U.S. Cl. 200—14 **7 Claims**



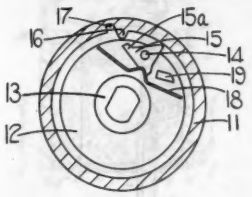
The invention relates to a dual-function switching apparatus intended particularly for controlling the two time bases of a dual time base oscilloscope. This switching apparatus comprises two switch contact assemblies of the wafer type driven in rotation by two coaxial shafts respectively. Each shaft is independently rotated by its own knob, these two knobs also being mounted coaxially one in front of the other. The rear knob has a datum index by which its position can be read on scale markings on the oscilloscope front panel. The front knob also has a datum index used for determining the position of this front knob. But to avoid parallax errors in reading the position of this front datum index on the scale markings, the rear knob is provided with auxiliary indexes which extend from the datum index on the front knob to the scale markings on the panel. When the datum index on the front knob is aligned with any particular auxiliary index on the rear knob, the position of the front knob is read by sighting along that auxiliary index from the front datum index to the scale markings.

3,621,159

IGNITION SWITCH WITH BLOCKING MEANS

Alec John Heap, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 10, 1970, Ser. No. 9,930
Claims priority, application Great Britain, Feb. 18, 1969, 8,614/69
Int. Cl. H01h *27/06*
U.S. Cl. 200—42 R **1 Claim**



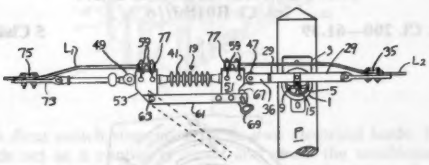
An electrical switch for use in road vehicles includes a casing carrying fixed contacts, and a rotor mounted for rotation in the casing of the rotor carrying a movable contact engageable with the fixed contacts to complete the circuits of the switch. The rotor has first and second stable positions with respect to the casing, and also has an unstable third position, the rotor being urged angularly from its third position back to its second position by a torsion spring. A cam form is provided on the casing, and a pawl is mounted on the rotor and is engageable with the cam form. The pawl is spring urged to either a first or second position relative to the rotor, and the arrangement of the pawl and the cam form on the casing is such that the pawl prevents movement of the rotor from its second position to its third position unless the previous movement of the rotor has been from its first position to its second position.

3,621,160

SELECTIVE MOUNTING DEVICE FOR IN-LINE SWITCHES

John L. Turner, East St. Louis, Ill., assignor to Turner Electric Corporation, St. Louis, Ill.

Filed Feb. 26, 1970, Ser. No. 14,617
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **9 Claims**

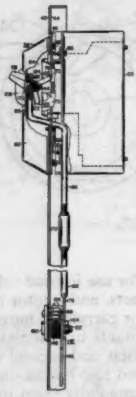


The invention provides a mounting for insulator mounted hook-operated in-line air break electric switches whereby the switch can be mounted selectively so that the switch blade swings in a vertical plane or in a plane inclined to the vertical. The mounting comprises a sleeve horizontally mountable on an insulator and having a pair of radial arms–one normal to the axis of the sleeve and the other at an acute angle, preferably about 60° to the axis of the sleeve. The switch supporting clevis which is coplanar with the switch may be secured by a bolt in embracing relation with either of these arms, so that the switch blade will swing in the same plane, vertical or inclined, as the sleeve arm to which the clevis is secured.

3,621,161
ELECTRIC SWITCH AND DOOR INTERLOCK OPERATING MECHANISM

Armand Mueller, Wauwatosa; Armand G. Mueller, Wauwatosa; Orval C. Bast, Milwaukee, and William H. Schmeling, Wauwatosa, all of Wis., assignors to Square D. Company, Park Ridge, Ill.

Filed July 13, 1970, Ser. No. 54,110
Int. Cl. H01h 9/20
U.S. Cl. 200—50 A 10 Claims

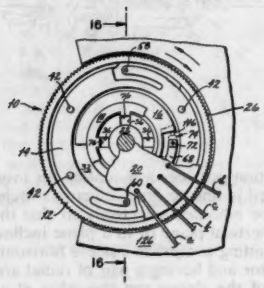


A switch and door interlock operating mechanism for a door that has a vault-type door locking mechanism. The mechanism includes an operating assembly that is mounted on the front surface of the door by concealed screws that also position a hinged support for a switch. The hinged support is rotatable to a position which will permit ready access to the terminals of the switch and positions the switch so that the buttons of the switch are aligned with a lever of the operator so the switch may be actuated from the front side of the door. The operator also has a connection with an interlock lever which will prevent opening of the door when the switch is turned on by the operator.

3,621,162
ROTATABLE SWITCH FOR PROVIDING ELECTRICAL PULSES AND INDICATING THE DIRECTION OF SWITCH ROTATION

Robert F. Wall, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 31, 1970, Ser. No. 24,276
Int. Cl. H01h 3/16
U.S. Cl. 200—61.39 5 Claims

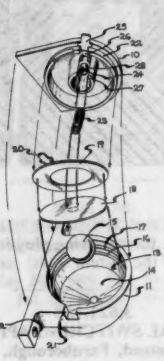


A rotatable switch having a printed circuit part including a plurality of conductive elements connected to terminals, which in turn may be connected to sources of operating potential. Two of the conductive elements cooperate with contacts of a rotatable switch part to produce electrical pulses, while other conductive elements of the printed circuit part cooperate with a switch contact of the rotatable switch part to sense and indicate the direction of switch rotation.

3,621,163
INERTIA SWITCH

Arthur A. Hitchcock, Cridersville, Ohio, assignor to A.C.B. Corporation, Lima, Ohio

Filed Jan. 19, 1970, Ser. No. 3,671
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 4 Claims



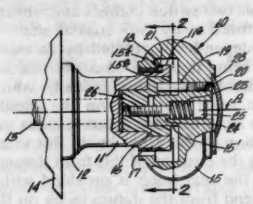
An inertia switch having a two-part housing of electrical insulating material, the lower housing part being provided with a conical ramp surface at its bottom to receive a relatively heavy ball which is adapted to move along the ramp surface in the event of a collision by an automobile, for example, to tilt a disc of electrical conductive material into contact with a flat electrical conductive ring. The ring is provided with a lead in the form of a tab extending through a notch in the housing part to the outside to receive suitable wires or leads. In engagement with the disc and extending through the center of the ring is a coil spring also of electrical conductive material, the upper end of which is disposed in a guide which is rigid with the inside of the upper housing part. Fixed within the guide and engaged by the coil spring is a conductive strip which extends to the outside of the housing through a notch in the housing part for the reception of a wire.

The upper housing part has a depending flange which fits frictionally into the lower housing part to hold the housing parts together and also to bear against the conical ramp may be built-up by increasing the wall thickness to serve as a block for reducing the effective scope of the switch.

3,621,164
APPARATUS FOR DISCHARGING STATIC ELECTRICITY

Stanley Backer, 5 Irving Road, Waban, Mass.

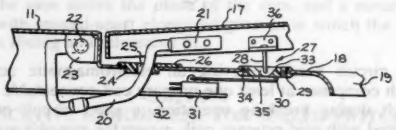
Filed Jan. 5, 1970, Ser. No. 569
Int. Cl. H01h 3/16
U.S. Cl. 200—61.58 13 Claims



Apparatus is disclosed for use in conjunction with operators such as doorknobs, switches, pushbuttons and the like to enable a person to effect a painless discharge of an accumu-

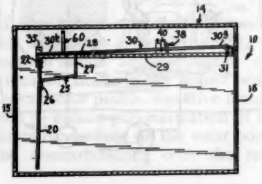
lated charge of electricity when the person contacts the operators. In each embodiment, the apparatus comprises two electrically conductive members one of which carries a contact surface which protrudes therefrom toward the other member but which is normally spaced therefrom by means of insulation including an airgap. Means is provided to bias the members away from one another so that the accumulated static charge is transferred from the person when he touches the member carrying the contact surface and urges it against the biasing means into engagement with or at least into proximity with the other member. The embodiments associated with doorknob structures are constructed to transfer static electricity when the knob is pushed, pulled or rotated; the embodiment associated with the pushbutton is constructed to transfer static electricity when the button is pushed; and the embodiment associated with the switch is constructed to operate when the switch is operated.

3,621,165
CLOSURE-OPERATED SAFETY SWITCH FOR AUTOMATIC APPLIANCE
Aidan M. Stone, Louisville, Ky., assignor to General Electric Company
Filed Sept. 21, 1970, Ser. No. 74,012
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.62 **3 Claims**



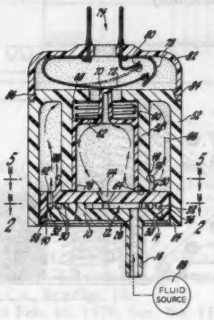
A safety switch to terminate the operation of an automatic appliance when a closure is moved from a closed position is provided including a cabinet-carried escutcheon movable laterally for alignment with an elongate, closure-carried projection adapted to engage a switch actuator disposed beneath the escutcheon. The escutcheon has a substantially centrally located aperture formed therethrough, the aperture being tapered provides a relatively large outer diameter facing the closure carried projection, and a relatively small inner diameter adjacent the interior of the cabinet. The inner diameter of the aperture is sufficiently small to prevent manual operation of the switch by an operator attempting to extend his finger through the aperture.

3,621,166
AIR IMPULSE ELECTRICAL SWITCH WITH ALTERNATE ACTION
Oscar F. Lindstrom, Great Falls, Mont.
Filed May 11, 1970, Ser. No. 35,953
Int. Cl. H01h *35/40, 13/60*
U.S. Cl. 200—81.9 R **11 Claims**



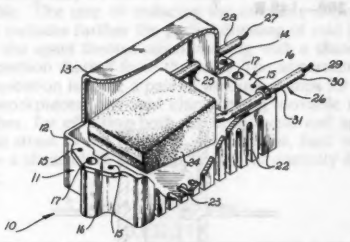
An air impulse electrical switch including a vane having an arm attached thereto for contacting a switch actuating member in the form of a loosely hinged rod. Upon deflection of the vane by an air impulse, the unhinged end of the rod moves along the sides of a triangular-shaped member between first and second positions on opposite sides of the member's apex. A pressure-sensitive switch is positioned in relation to the rod so as to provide actuation and deactuation thereof when the rod is in the first and second positions, respectively.

3,621,167
PISTON SWITCH CONTROLLED BY FLUID AMPLIFIER WITH TIME DELAY
Harold J. Burke, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 2, 1969, Ser. No. 881,366
Int. Cl. H01h *43/28;* **F15c** *1/14;* **H01h** *35/38*
U.S. Cl. 200—82 **3 Claims**



A fluid oscillator actuator having a bistable fluid amplifier including low- and high-speed circuits, and an actuator portion including a fluid motor responsive to the fluid amplifier is shown and described. The oscillator is assembled in a unitary structure and includes timing elements such as restrictors and capacitors for the low-speed circuit. The oscillator may be operated in a vacuum envelope and use atmospheric air for the fluid amplifier power source or it may be operated in the atmosphere using superatmospheric fluid as the power source.

3,621,168
SWITCHING DEVICE
John E. Durand, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Apr. 30, 1970, Ser. No. 33,318
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 B **2 Claims**

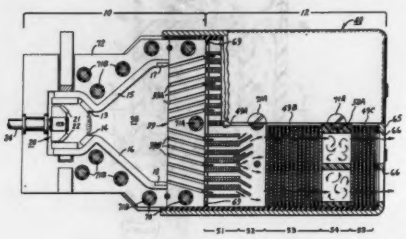


A float switch suspended by its own electrical leads. The leads act as a cantilever beam and avoid the troublesome hinges of the prior art. A mercury switch is also encapsulated in a watertight foam plastic that has gas-filled cells. Thus, the plastic acts as a float, a mounting, and a watertight enclosure for the switch.

3,621,169
ELECTRIC CIRCUIT INTERRUPTER WITH NOVEL ARC GAS DISCHARGE MUFFLE ASSEMBLY
Eldon B. Heft, W. Hartford, and Harold A. Humpage, Forestville, both of Conn., assignors to General Electric Company
Continuation of application Ser. No. 593,945, Nov. 14, 1966, now abandoned. This application Apr. 20, 1970, Ser. No. 28,259
Int. Cl. H01h *33/08*
U.S. Cl. 200—144 R **6 Claims**

An electric circuit interrupter including arc establishing and interrupting means having an arc-gas venting portion and

an arc-gas filter and muffle portion in juxtaposed relation to the arc-gas venting portion, combined with a sleeve of elastomeric material surrounding the muffle portion and at least a portion of the arc establishing and interrupting means, the sleeve including a circumferentially extending inwardly directed rib positioned between the muffle portion and the arc establishing and interrupting means, the sleeve serving to prevent the flow of gases other than in the intended path of flow through the assembly.



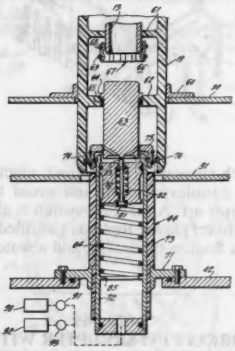
In accordance with another aspect, a plurality of arc generating and interrupting assemblies are positioned side by side to provide a multipole device, and an integral metallic, generally boxlike, enclosure is provided surrounding all of the interrupting assemblies and having an end wall with openings therein permitting the flow of arc gases therethrough, the metallic enclosure permitting the device to withstand extremely high pressures during interruption.

3,621,170

GAS-FILLED SEPARABLE CONTACTS FOR HIGH-VOLTAGE SWITCHGEAR

Otto Jensen, Plymouth, tish W. Indies, assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Sept. 24, 1970, Ser. No. 75,113
Int. Cl. H01h *33/54*
U.S. Cl. 200—148 R **6 Claims**



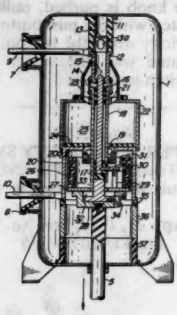
A chamber filled with high-pressure SF_6 surrounds the disconnect contacts of a circuit breaker when the breaker is connected to the cooperating terminals of a metal-clad switchgear housing to permit a relatively short bushing length.

3,621,171

GAS BLAST CIRCUIT BREAKER WITH PUFFER PISTON HAVING AN ELECTRODYNAMIC ASSIST IN THE FORM OF AXIALLY OVERLAPPING COILS

Yoshio Yoshioka, Hitachi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1969, Ser. No. 821,319
Claims priority, application Japan, Aug. 30, 1968, May 6, 1968, July 12, 1968, 43/61788; 43/29868; 43/48490
Int. Cl. H01h *33/91*
U.S. Cl. 200—148 A **11 Claims**



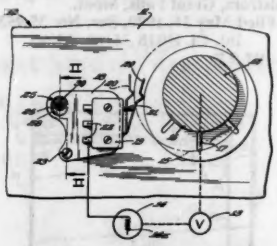
A circuit breaker having an electromagnetic actuator which comprises at least one primary coil connectable to the circuit during breaking operation, a short circuit coil associated with said primary coil, means for movably supporting one of said primary coil and said short circuit coil, and compressing means for an arc-extinguishing gas mechanically connected with the movable one of said primary coil and said short circuit coil, said primary coil and/or said short circuit coil having a large axial length such that the electromagnetic repulsive force acting therebetween has a flat characteristic, the movable one of said primary coil and said short circuit coil being brought into overlapped relation with the other in a part of the moving stroke thereof.

3,621,172

SWITCH-ACTUATING MEANS AND ADJUSTABLE CAMMING CONSTRUCTION

Malcolm D. Clark, Glasgow, Scotland, assignor to Raymond Control Sytems, Inc.

Filed Apr. 21, 1969, Ser. No. 817,779
Int. Cl. H01h *21/28*
U.S. Cl. 200—153 **1 Claim**



Switch-actuating means employing an eccentric cam which is supported above a surface for rotational sliding engagement with the operating lever arm of a switch. The switch is carried above the surface on a mounting bracket which includes means for adjusting the position of the switch lever arm in the path of rotation of the cam, whereby the electrical condition of the switch corresponds to the desired rotational condition of the shaft on which the cam is carried for accurately controlling the prime mover of a valve so that the prime mover is deenergized upon operation of the valve thereby to an open or a closed condition.

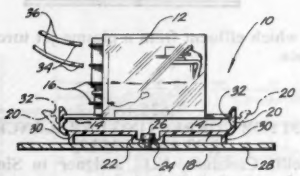
ERRATUM

For Class 200—153 G see:
Patent No. 3,621,189

3,621,173
MOUNTING MEANS FOR ELECTRICAL DEVICES

Theodore H. O'Cheskey, Whittier, Calif., assignor to United States Filter Corporation, Whittier, Calif.

Filed Aug. 27, 1970, Ser. No. 67,339
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 C **3 Claims**

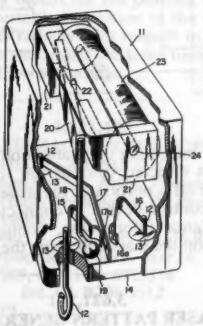


A relay mount includes a case for a relay, ears projecting away from both sides of the case, connector pins extending from the case above the plane of the ears, and a mounting track with spaced-apart elongated grooves in which the ears make a sliding and releasable fit.

3,621,174
LUBRICATIVE ATMOSPHERE FOR SEALED SWITCHES

Robert A. Holcomb, Waynesboro, Va., assignor to General Electric Company

Filed Oct. 28, 1968, Ser. No. 770,967
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 G **17 Claims**



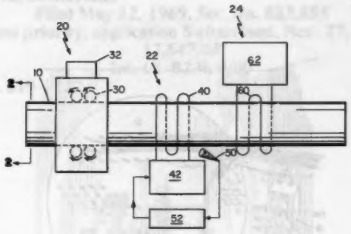
A controlled atmosphere containing a monocarbon compound selected from the group consisting of methanol, chloroform, methyl iodide and methylene chloride is introduced into cleaned hermetically sealed relays to provide lubrication of metal wear points. Reactive metal for the wear points is selected to induce polymerization of the compound to obtain a lubricative surface on the wear points. The compound must be noncarbonizing over the relay operating range.

3,621,175
CONTINUOUS WELDING

Peter Dominic Prevett, Stoneham, and Theodore Joseph Morin, Needham, both of Mass., assignors to Industrial Magnetics, Inc., Canton, Mass.

Filed Sept. 20, 1968, Ser. No. 761,032
Int. Cl. B23k *13/00*
U.S. Cl. 219—9.5 **4 Claims**

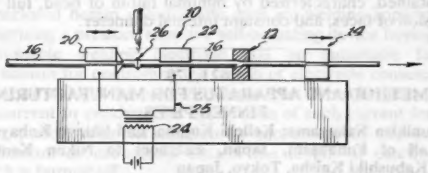
Welding together two elements by placing their surfaces next to each other, moving them simultaneously along a path, heating successive zones of the elements at a station on the path and thereafter moving the successive zone through a zone of pulsed high magnetic field at another station.



3,621,176
WELD REDUCING METHOD AND APPARATUS

Raymond L. Valente, Kankakee, Ill., assignor to Manco Manufacturing Co., Bradley, Ill.

Filed Feb. 16, 1970, Ser. No. 11,741
Int. Cl. B23k *11/02*
U.S. Cl. 219—57 **2 Claims**



A method and apparatus for processing workpieces in the form of bar stock or the like prior to the drawing of said pieces through a reducing die. The method includes the steps of joining the workpieces together by welding to produce a welded joint, and then reducing the effective diameter of said joint by the application of a tensile stress thereto so that said welded joining may be drawn through a die without damaging said die. The step of reducing the effective diameter of said joint includes further the partial dressing of said joint by engaging the upset formed upon welding with a shear blade to sever portion thereof from the joint. The apparatus of the present invention include a pair of welding clamps for engaging said workpieces, one said clamp being movable relative to the other, for effecting both the upset weld and applying the tensile stress to the resulting welded joint. Said movable clamp has a shear blade formed thereon for partially dressing said joint.

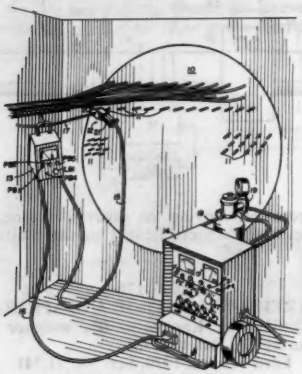
3,621,177
METHOD AND APPARATUS FOR TIG TUBE WELDING

Neil Freeman McPherson, Oakville, and Nils Hanssmann, Ancaster, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Dec. 9, 1968, Ser. No. 782,370
Int. Cl. B23k *31/06*
U.S. Cl. 219—61 **13 Claims**

Described herein is a method and apparatus for fully automatically weld-joining lengths of metal instrument tubing employing the TIG welding process to advance a weld puddle about the periphery of the junction of aligned ends of straight tubing, respective end portions of which are held in a closed chamber rigidly clamped in spaced seats of a robust metal head to resist elongation by heating; the unit comprises a handle portion axially separably joined with the head and providing drive to a rotating electrode carrier spool therein about the work, angular interval marking signals being transmitted to a remote control unit from which welding current and gas is supplied to the head according to a weld program selected for the material being joined. A welding cycle commences with a stationary arc developing a weld pool, followed by advance at uniform speed of the arc with controlled

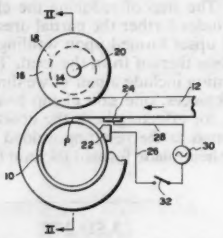
current levels over sectors, the arc being sustained beyond 360° and the complete cycle spanning two revolutions of the carrier and terminating with a bead-cooling gas flow. Repeatable welds of high quality on a production basis may be obtained, characterized by minimal fall-in of bead, full area fusion of faces, and constant internal diameter.



3,621,178
METHOD AND APPARATUS FOR MANUFACTURING FINNED PIPES

Kunihiro Nakayama; Keiichi Kojima, and Shingo Kobayashi, all of Funabashi, Japan, assignors to Nikon Kentetsu Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1970, Ser. No. 3,024
Claims priority, application Japan, Jan. 22, 1969, 44/4590
Int. Cl. B23k *1/16*
U.S. Cl. 219—107 **4 Claims**



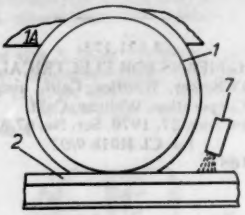
A metallic strip is wrapped into a helix around a metallic pipe by having one of its edges contacted by the pipe and welded on to the pipe with a welding current having a frequency ranging from 1 to 10 MHz. The current is applied across the strip and pipe from very close to a point where the strip begins to contact the pipe.

3,621,179
CLEANING METAL SURFACES TO REMOVE GREASE FILMS

Jozef K. Tylko, Faringdon, England, assignor to Tetronics Research & Development Company, Ltd., Faringdon, England

Continuation-in-part of application Ser. No. 702,864, Feb. 5, 1968. This application Feb. 16, 1970, Ser. No. 11,817
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P **8 Claims**

A method of treating a wearing surface of a railhead to remove an oil film and improve traction of a locomotive

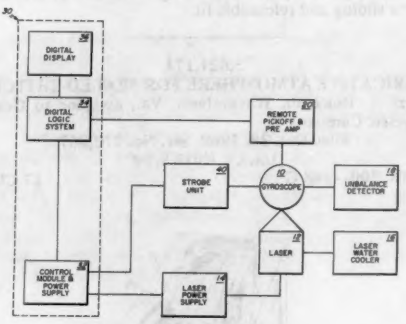


thereon in which effluent from a plasma jet torch is applied to the surface.

3,621,180
SYSTEM FOR CORRECTING UNBALANCES ON A ROTATING MASS

William Rolff, Carlstadt, N.J., assignor to Singer-General Precision Inc., Little Falls, N.J.

Filed June 3, 1969, Ser. No. 830,058
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **2 Claims**

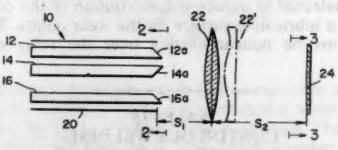


A system for correcting unbalances on a rotating mass, in which a laser is directed towards the rotating mass and is adapted to burn off a portion of the mass during its rotation. An electronic control device is connected to the laser for receiving unbalance information, comparing same with a reference point on the mass and firing the laser accordingly.

3,621,181
LASER PATTERN GENERATOR

Charles Gilbert Young, Storrs, Conn., assignor to American Optical Corporation, Southbridge, Mass.

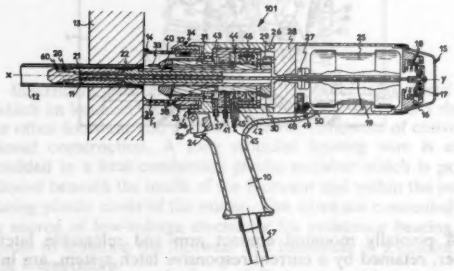
Filed Aug. 15, 1969, Ser. No. 850,514
Int. Cl. H01s *3/02;* **B23k** *11/00*
U.S. Cl. 219—121 L **10 Claims**



A system and construction for spot welding either in an industrial environment or for repairing retina detachments in the medical field is disclosed as comprising a fagot-laser system with each individual rod including an output end face whose normal is not colinear to the main axis of the rod. Various patterns can be generated with the arrangement by imaging the near field of the output at the laser rod ends onto

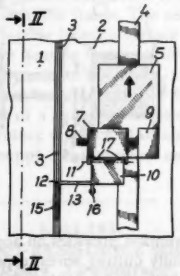
the work piece or target at the desired magnification and rearranging or rotating the individual rods. An alternative arrangement is to image the far field onto the work at the desired magnification and to rotate the individual rod elements to achieve pattern variation.

3,621,182
ROTARY WELDING GUN
Jean-Pierre Peyrot, 8, domaine du Bel-Abord, Chilly-Mazarin, Essonne, France
Filed Nov. 28, 1969, Ser. No. 880,714
Claims priority, application France, Nov. 29, 1968, 176,113
Int. Cl. B23k 9/12
U.S. Cl. 219—125 R 9 Claims



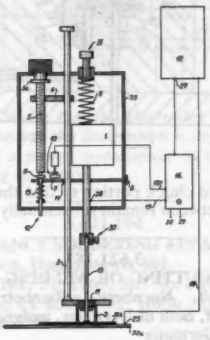
A rotary welding gun comprising a handle, an intake of gas utilized to prevent any oxidation of the weld, an inlet of cooling water, an electric current input, all the intakes being contained in a conduit in the interior of the handle, a built-in motor driving an axial shaft, a positioning mandrel projecting towards the exterior round the said axial shaft at its free extremity opposite to that of the motor, a centering means, a torch-mounted eccentric radially with respect to said mandrel, axial-adjusting means for the position of the torch, expansion means adjustable in relation to the mandrel so as to center said mandrel radially with respect to the internal surface of a tube to be welded, at the same time permitting rotation of the mandrel inside the tube.

3,621,183
SELF-PROPELLED MACHINE FOR SUPPORTING AN OSCILLATING TOOL
Andre Alphonse Chambonnet, Arles, France, assignor to La Societe "Constructions Metalliques De Provence, Levallois, Hauts de Seine, France
Filed Mar. 3, 1970, Ser. No. 16,022
Claims priority, application France, Mar. 4, 1969, July 25, 1969, 6906164; 6925374
Int. Cl. B23k 9/12
U.S. Cl. 219—125 PL 9 Claims



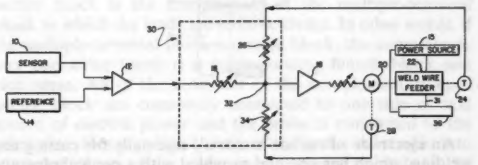
Self-propelled machine for supporting a tool which is required to describe a meandering path between the edges of two metal sheets disposed end-to-end, e.g. a welding machine, comprising means for automatically controlling the amplitude of the oscillations of the tool so that it is always equal to the width of the slot between the two sheets.

3,621,184
SPOT WELDING APPARATUS
Andre Mieville, Lausanne, Switzerland, assignor to M.E.D.I., Geneva, Switzerland
Filed May 12, 1969, Ser. No. 823,555
Claims priority, application Switzerland, Nov. 27, 1968, 17,647/68
Int. Cl. B23k 9/00
U.S. Cl. 219—127 4 Claims



Disclosed herein is automatic spot arc-welding apparatus comprising a pressure sensitive self-actuating device having a consumable welding electrode and an automatic feed mechanism for controlling the length of electrode consumed from one weld to the next. A delay circuit controls the welding current to continue the application of such current for a short period after termination of movement of the feed mechanism to accurately control the length of electrode which is burned off.

3,621,185
WELDING SYSTEM
William F. Iceland, Los Alamitos, and Donald R. Lien, La Habra, both of Calif., assignors to North American Rockwell Corporation
Filed May 12, 1969, Ser. No. 823,634
Int. Cl. B23k 9/00
U.S. Cl. 219—130 2 Claims

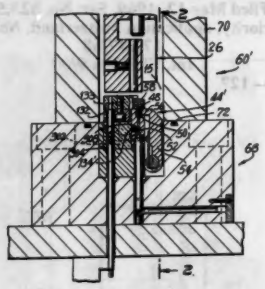


The invention pertains to MIG-welding apparatus wherein the actual speed of a welding wire is compared with the feeding rate of the feeding means and conditions at the arc, to compensate for slippage between the feeding means and welding wire thereby improving the response to changes in welding conditions.

3,621,186
SUPPORT STRUCTURE
Milton Stoll, 14-19 212th Street, Bayside, N.Y.
Continuation-in-part of application Ser. No. 558,142, June 16, 1966, now Patent No. 3,490,886, dated Nov. 25, 1969. This application Nov. 28, 1969, Ser. No. 880,867
Int. Cl. B23k 9/28
U.S. Cl. 219—138 10 Claims

Structure for supporting a plurality of generally tubular casing members during sealing thereof comprising a plurality of sets of separated heat-conducting chuck portions, heater

means for raising the temperature of one of each pair of chuck elements and refractory low expansion means for supporting the heated chuck portion so that the center-to-center distances therebetween remain substantially constant.

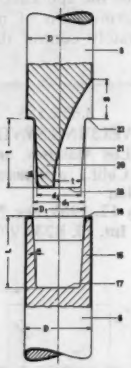


3,621,187

SECTIONAL CUTTING OR WELDING ELECTRODE

Bernard Reichelt, Nurnberg-Laufamholz, and Richard Winter, Altdorf, both of Germany, assignors to C. Conradty, Nurnberg, Germany

Filed July 14, 1969, Ser. No. 841,321
Claims priority, application Germany, Dec. 27, 1968, P 18 17 096.2
Int. Cl. B23k *35/00*
U.S. Cl. 219—145 **4 Claims**



An electrode of carbon material, especially for cutting and welding, which has one end provided with a conical plug and has its other end provided with a socket having a complimentary inner conical surface, and in which the outer surface of the plug and at least that one third of the inner conical surface of said socket which comprises the largest diameter of said inner conical surface is provided with a metallic coating.

3,621,188

WELDING ELECTRODE

A. David Joseph, New Canaan, Conn., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Oct. 25, 1968, Ser. No. 770,787
Int. Cl. B23k *35/22*
U.S. Cl. 219—146 **10 Claims**

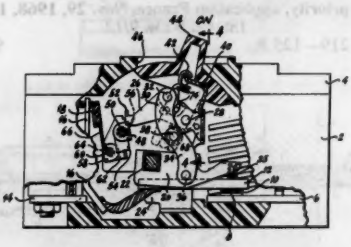
This invention comprises a coated electrode having a core of copper or a copper alloy and aluminum or an aluminum alloy. The coating of the electrode is composed of the fluoride of at least one of the metals chosen from the group consisting of aluminum, sodium, lithium, potassium, barium, calcium, zinc, tin and cadmium, and the chloride of at least one of the metals chosen from the same group.

3,621,189

TOGGLE LINKAGE CONTACT OPERATING MECHANISM FOR ELECTRIC CIRCUIT BREAKER

Donald A. Link, Hubertus, Wash., and Fred H. Williams, Milwaukee, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 26, 1970, Ser. No. 67,146
Int. Cl. H01h *5/06, 21/42*
U.S. Cl. 200—153 G **6 Claims**



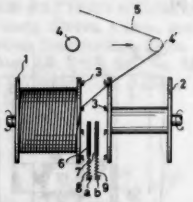
A pivotally mounted contact arm and releasable latch lever, retained by a current-responsive latch system, are interconnected by a toggle linkage, the knee of which is connected by tension springs to a manually movable handle operable to collapse and straighten the toggle to effect opening and closing movement, respectively, of the contact arm. A cam follower is pivotally suspended from the connection joining the toggle linkage and latch lever and has a free end interposed between a fixed cam and one link of the toggle, the follower being drawn along the cam by movement of the latch lever when released to break the knee overcenter of the linkage, accelerate the collapse of the toggle, and restrain the upper toggle link to prevent contact-arm rebound.

3,621,190

CONTINUOUS WINDING APPARATUS

Kazumasa Morikawa, Ichihara-shi; Makoto Kobayashi, Nikko-shi; Hiromitsu Sato, Nikko-shi, and Jun Nakajima, Nikko-shi, all of Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Filed Nov. 18, 1969, Ser. No. 877,770
Claims priority, application Japan, Nov. 26, 1968, Oct. 13, 1969, 43/86576; 44/81671
Int. Cl. C21d *9/62;* **H05b** *1/00;* **B65h** *54/00*
U.S. Cl. 219—155 **6 Claims**



The present invention provides an apparatus for automatically and electrically cutting wires, especially those of large diameters, in a high-speed continuous winding apparatus, particularly one having two or more spools for successive wire winding, in which a wire is made to contact and short with a plurality of closely arranged electrodes while being moved from a spool on which the wire has been wound in a prescribed quantity to another empty spool and, at the point of contact, melted to break or to be so softened by heat as to be torn off under wire tension.

3,621,191
ELECTRICALLY HEATED FOOTWEAR AND HANDWEAR
Woodrow D. Cornwell, Middletown, Va. 22645
Filed Apr. 21, 1970, Ser. No. 30,497
Int. Cl. H05b 1/00
U.S. Cl. 219—211 1 Claim

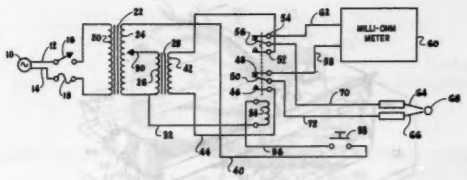
Electrically heated footwear and handwear is disclosed in which an ionomer plastic insulating layer is fitted into a shoe or other footwear and a mitten or other handwear of conventional construction. A long stranded heating wire is embedded in a heat-conducting plastic member which is positioned beneath the insole of the footwear and within the insulating plastic cover of the mitten. The wires are connected to a source of low-voltage electricity for resistance heating in order to maintain the footwear and handwear at a comfortable temperature.

3,621,192
ELECTRICALLY HEATED CHAIR
Alfred Pohler, Reutte, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.
Filed Oct. 17, 1969, Ser. No. 867,122
Claims priority, application Austria, Nov. 11, 1968, 10954/68
Int. Cl. H05b 1/00
U.S. Cl. 219—217 5 Claims

An article of body-supporting furniture having an open frame and a receiving section connected to said frame to provide a seating area within the frame. The reclining section including a reclining, flexible heating surface having a layer of electrically conductive heating material, insulating layers enclosing said electrically conductive layer, and electrical contacts connected to said heating material for electrical connection to live voltage or a battery. The heating material having a positive temperature coefficient of electrical resistance to minimize voltage supply requirements and to provide current limitations.

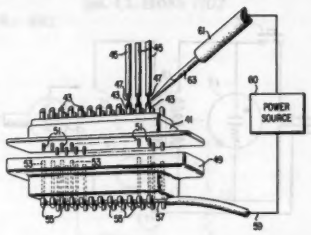
3,621,193
POSITIVE CONTACT RESISTANCE SOLDERING UNIT
George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert D. Banta, Merritt, Fla.
Filed Sept. 21, 1970, Ser. No. 73,834
Int. Cl. B23k 3/04; H05b 3/00
U.S. Cl. 219—234 2 Claims

A positive contact resistance soldering unit which has a relay therein, which is operated by a foot switch for selectively coupling a milliohmeter to the electrodes for measuring the resistance between the electrodes and the workpiece in order to determine the best contact therebetween. When the



milliohmmeter indicates that the electrodes are in good contact with the workpiece the foot switch is depressed connecting the output of a power transformer to the electrodes to begin the soldering operation.

3,621,194
RESISTANCE SOLDERING APPARATUS
Clara M. Vermillion, Huntingtown, Md.
Filed Dec. 31, 1969, Ser. No. 889,558
Int. Cl. B23k 1/12; H05b 3/00
U.S. Cl. 219—234 7 Claims

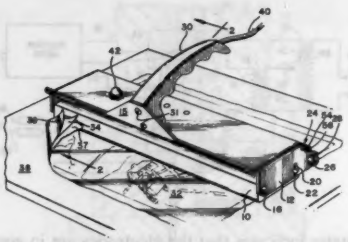


An apparatus for resistance soldering a plurality of electric leads to a multiple-terminal block and generally comprises a complementary connector block and a probe. The probe and the complementary connector block are connected to a suitable source of electric power. The complementary connector block is the complement of the multiple-terminal block to which the leads are to be soldered. In other words, if the multiple-terminal block is a male block, the complementary connector block is a corresponding female block and vice versa. All of the terminals of the complementary connector block are commonly connected to one side of said source of electric power and the probe is connected to the other side. Hence, when the tip of the probe is brought into contact with any of the solder cups or connecting tabs of the multiple-terminal block, current flows through that cup and generates sufficient heat for resistance soldering to take place.

3,621,195
DRY MOUNT APPARATUS
Paul Goldstein, deceased, late of Belmont, Mass. (Phyllis Goldstein Kirschner, executrix), assignor to The Rolla-Mount Joint Venture, Boston, Mass.
Filed Oct. 2, 1969, Ser. No. 863,761
Int. Cl. H05b 1/00
U.S. Cl. 219—243 3 Claims

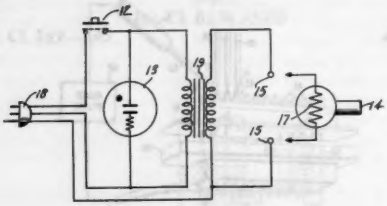
A simple and effective device for the dry mounting of different-size prints or photographs on support boards. A heated platen or relatively large area and a heat-absorbing roller thermally isolated from the platen are supported on a frame for movement across the surface of a photograph being mounted. The platen is effective to apply uniform heat and pressure while melting the adhesive resin of a dry mount

tissue and pressing the melted resin into intimate contact with the surfaces being bonded; the roller being operative to



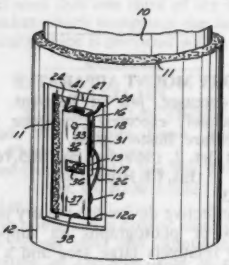
maintain all surfaces in firm contact while removing heat therefrom to effect a rigid and strong bond.

3,621,196
ELECTRIC CIGARETTE LIGHTER
William Reinbolt Sammet, 158 Marlboro Ave., Columbus, Ohio
Filed June 2, 1970, Ser. No. 42,823
Int. Cl. F23g *7/22*
U.S. Cl. 219—269 **1 Claim**



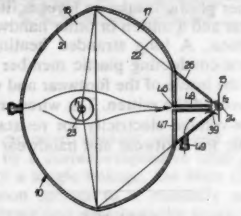
A cigarette lighting device which is electrically operated by being plugged into an electrical outlet. This device includes a housing containing a push-in-type thermostatically controlled lighter similar to that of the automobile lighter. The device also includes a transformer and pilot lamp which indicates when the device is on. A switch on exterior of the housing allows the device to be turned on or off when desired.

3,621,197
PROTECTOR SHIELDS FOR THERMOSTATS
Donald E. Place, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio
Filed Oct. 15, 1970, Ser. No. 81,029
Int. Cl. F24h *1/00*
U.S. Cl. 219—328 **6 Claims**



A protective shield for the terminals of thermostats mounted on water heaters is disclosed. The shield is formed of heavy fish paper shaped to provide access to the thermostat controls while preventing accidental contact with the terminals and connecting leads. Mounting portions are provided on the shield for removably mounting the shield in place.

3,621,198
APPARATUS FOR HEAT OPERATING A WORKPIECE WITH THE AID OF AN OPTICAL PROJECTION OF A RADIATION SOURCE
Horst Herbrich, Frankfurt am Main, Germany, assignor to Messer Griesheim G.m.b.H., Frankfurt am Main, Germany
Filed July 15, 1968, Ser. No. 745,656
Claims priority, application Germany, July 14, 1967, P 16 27 554.0
Int. Cl. H05b *3/02*; **A61n** *5/06*
U.S. Cl. 219—349 **8 Claims**

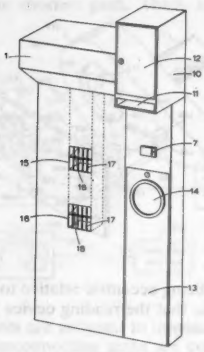


An apparatus for the heating, melting, welding, brazing, cutting and the like of a workpiece with the aid of the optical projection of a radiation source. The radiation source is disposed within a radiation focusing chamber at one focal point thereof and the radiation therefrom exits the chamber through a radiation outlet to impinge on a second external working focal point. A pressurized gas, which may be a cooling gas, protective gas or reactive gas may be introduced into at least a portion of the chamber. The gas discharges through the radiation outlet and prevents entry into the chamber of damaging vapors which develop during use of the apparatus. The chamber may be divided by a radiation permeable partition into a pair of compartments; a first containing the radiation source and a second having the radiation outlet. The gas may be introduced into the first compartment to exit through an aperture in the partition into the second compartment for discharge through the outlet. Alternatively a first gas may be introduced into the first compartment and a second gas may be introduced into the second compartment whereby both gases, either mixed or unmixed are discharged through the outlet. In other embodiments, the first compartment may be sealed and the gas or gases introduced directly into the second compartment. The second compartment may include a narrow tube disposed substantially coaxial with an imaginary line interconnecting the foci for directing a concentrated stream of a gas toward the workpiece. A fiber optic rod may be mounted at the radiation outlet to provide a concentrated radiation at a point removed from the second focus. The rod may have a bore for passage of the pressurized gas from the chamber.

3,621,199
BODY DRYING APPARATUS
Arthur Goldstein, 375 Milton Road, Cambridge, England
Continuation-in-part of application Ser. No. 799,797, Feb. 17, 1969. This application Nov. 14, 1969, Ser. No. 876,949
Int. Cl. F24h *3/04*
U.S. Cl. 219—370 **14 Claims**

An apparatus is provided for drying the whole body of a person by hot air with the assistance of paper or other towels. The apparatus comprises a conduit or duct for hot air having

an outlet. A deflector is arranged to deflect a stream of hot air issuing from the outlet, and is oscillated so as to cause the



stream of air to sweep upwards and downwards over the body.

3,621,200

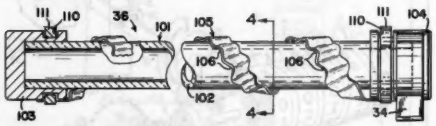
HEATING ELEMENT AND PACKAGING MACHINE EQUIPPED THEREWITH

Ridley Watts, Jr., Cleveland, Ohio, assignor to American Packaging Corporation, Hudson, Ohio

Continuation-in-part of application Ser. No. 726,513, May 3, 1968. This application Oct. 31, 1968, Ser. No. 772,160

Int. Cl. H05b *3/10;* **B65b** *31/00;* **F24h** *3/04*

U.S. Cl. 219—377 **20 Claims**



A machine for thermoforming and skin packaging is equipped with electric heaters having very fast response and high efficiency. In the preferred embodiment, a corrugated Nichrome ribbon heater element is helically wound around an elongated cylindrical core of quartz or other material transparent to radiant energy with the corrugations in substantially point contact with the core. In an alternative embodiment, an uncorrugated ribbon heater element is helically wound around an elongated quartz core having a generally star-shaped transverse cross section. In both embodiments the heater element is stress relieved in the helical configuration and is in relaxed condition on the core. Convolution of the ribbon may be of varying concentration along the core to provide nonuniform heat distribution where that is desired.

3,621,201

DEVELOPER APPARATUS FOR HEAT DEVELOPING PAPER

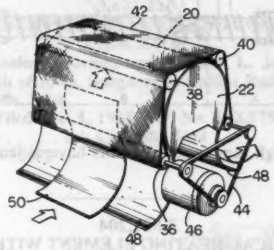
Paul J. Crane, Torrance, and Glenn A. Reese, San Pedro, both of Calif., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Apr. 24, 1969, Ser. No. 819,066

Int. Cl. F27b *9/06*

U.S. Cl. 219—388 **7 Claims**

An image developer for heat developing paper, such as dry silver paper, wherein a curved platen is heated by passing a current therethrough, thereby obtaining very quick heating time and very uniform heat. A belt means, such as a fabric belt, is held by rollers snugly against the platen surface that is heated, and the belt is driven by connecting the rollers to a motor and the paper to be developed is inserted between the



fabric belt and the platen and caused to move about the heated platen, thereby providing "averaging" the heat to the paper.

3,621,202

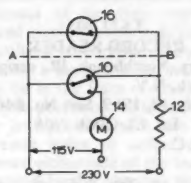
AUTOMATIC DRYING CYCLE FOR CLOTHES DRYERS

Rudolf Gemert, London, Ontario, Canada, assignor to GSW Limited-GSW Limitee, Toronto, Ontario, Canada

Filed Nov. 16, 1970, Ser. No. 89,540

Int. Cl. H05b *1/02*

U.S. Cl. 219—492 **1 Claim**



A drying control system in automatic dryers involves the use of two thermostats with a timer and heating element, the thermostats being positioned in the exhaust airstream emanating from the drying chamber. The first thermostat is set for a lower temperature range than the second thermostat and both thermostats provide for operation of the heating element until the temperature has risen to a predetermined level, after which the thermostate set in the lower temperature range will switch to bring the timer into the circuit. The heating element continues to draw current through the thermostat set in the higher range but when the temperature reaches the upper level at which the higher range thermostat is set, the latter will open to switch off the heating element. Sequentially, the second thermostat will then cycle on and off until the total time of the timer has expired.

3,621,203

ELECTRIC RESISTANCE HEATING CABLE

Louis Joseph Henri Geominy; Hubertus Johannes Josephus Gommans; Leonardus Frans Helene Mans, and Silvester Marie Ruytenbeek, all of Venlo, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed July 7, 1970, Ser. No. 52,801

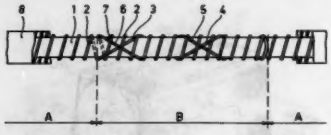
Claims priority, application Netherlands, June 26, 1970, 7009422

Int. Cl. H05b *3/34, 3/54*

U.S. Cl. 219—528 **6 Claims**

A resistance heating cable having relatively high and low temperature sectors during operation. The cable has a flexible core, a resistance wire wound thereon and an outer covering. The resistance wire is wound with a number of

layers in the low temperature sectors one across the other, which layers establish mutual electrical contact with each



other. The high temperature sectors have at least two layers of windings.

3,621,204
ELECTRICAL HEATING ELEMENT WITH FUSED MAGNESIA INSULATION

Manfred Neidhardt, Ranzel near Troisdorf, and Joseph Schneider, Lulsdorf near Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft

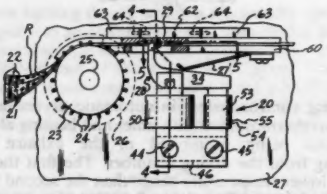
Filed Apr. 29, 1970, Ser. No. 33,054
Claims priority, application Germany, Apr. 29, 1969, P 19 21 789.1
Int. Cl. H05b *3/18;* **H01c** *7/02;* **H01b** *3/10*
U.S. Cl. 219—553 **6 Claims**

An electrical heating element comprising a resistance wire in a metal tubular jacket insulated therefrom with a fused granular magnesia is improved from the standpoint of electrical leakage or loss by admixing with the magnesia a small amount of a sintered and finely divided magnesium silicate or magnesium oxide having a particle size substantially completely under 10 microns.

3,621,205
RECORD READER

Wilburn F. Bradbury, Northbrook, Ill., assignor to SCM Corporation, New York, N.Y.

Filed July 30, 1969, Ser. No. 846,094
Int. Cl. G06k *7/08*
U.S. Cl. 235—61.11 C **21 Claims**



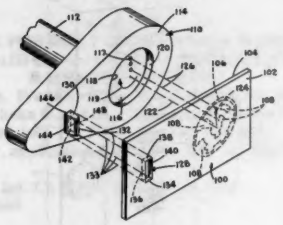
There is disclosed a record reader having a plurality of sensing levers corresponding in number to the number of code hole positions across the record medium. Each sensing lever is associated with a magnetic circuit. In two embodiments the magnetic circuits are provided by electromagnets and in two other embodiments the magnetic circuits are provided by a permanent magnet. Each sensing lever moves when it senses the presence of a code hole and consequently the condition of its respective magnetic circuit is changed. Each magnetic circuit has an output circuit which generates one type of signal if the associated lever senses the presence of a code hole and another type of signal when it senses the absence of a code hole.

3,621,206
LABEL-ALIGNING SYSTEM

Albert W. Scribner, Darien, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 21, 1969, Ser. No. 852,016
Int. Cl. G06k *7/10, 19/04*
U.S. Cl. 235—61.11 E **17 Claims**

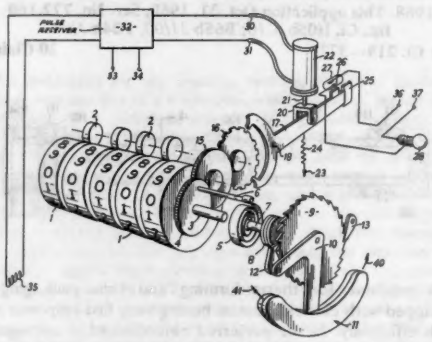
In a data-reading system of the type which includes a label and a reading device which must be aligned with that label, the aligning function is performed by a plurality of locating surfaces on the label and a cooperating pair of locating surfaces on the reading device, at least one of the locating surfaces on the label being eccentric relative to the circular data field of the label so that the reading device is oriented angularly as well as linearly.



3,621,207
ROAD PRICING METER

Patrick Bass, London, England, assignor to United Gas Industries, London, England

Filed Apr. 7, 1969, Ser. No. 813,908
Claims priority, application Great Britain, Apr. 19, 1968, 18,716/68
Int. Cl. G06m *1/08;* **G01d** *4/00*
U.S. Cl. 235—92 C **4 Claims**



A meter for receiving and counting impulses from outside suitable, for instance, as a road pricing meter to be carried on a motor vehicle and to receive and count impulses to indicate the amount of use made by that vehicle of the road. The meter includes a spiral power spring which is coupled to a counter through an escapement. The escapement is operated by the signals received from outside to permit a desired degree of advancement for each signal. The energy in the spiral power spring is replenished by means of an oscillating weight winding the spring up through a pawl and ratchet gear.

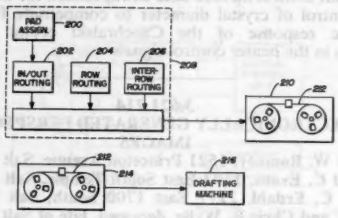
3,621,208
SIGNAL POINT INTERCONNECTION ROUTING

Donald D. Isett, Dallas; Judy A. Hellmer, Dallas, and Herman W. Van Beek, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1969, Ser. No. 841,867
Int. Cl. G06f *9/06*
U.S. Cl. 235—150 **16 Claims**

Active components, such as logic gates or flip-flops, formed in a semiconductor substrate are interconnected to input/output bonding pads and other active components in a circuit array in four separate operations. First, after arranging the active components in rows, signal points of all com-

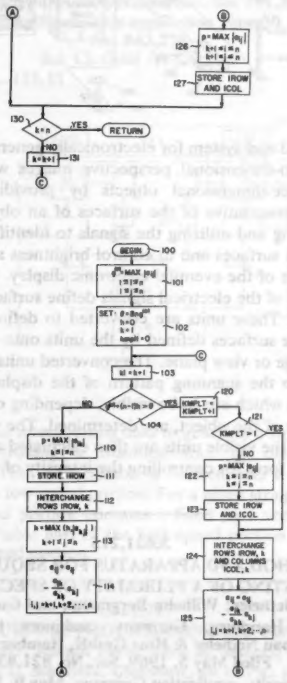
ponents in one row are interconnected by considering the longest interconnection and proceeding to the shortest. Next, component signal points between rows are interconnected again by considering the longest interconnecting path and proceeding to the shortest path. Third, input/output component signal points are assigned to input/output conductive pads. Finally, interconnecting paths are completed between the input/output component signal points and an assigned pad in a numbered order. Each operation uses a distinct algorithm to complete the necessary steps.



3,621,209
MACHINE-IMPLEMENTED PROCESS FOR INSURING THE NUMERICAL STABILITY OF GAUSSIAN ELIMINATION

Peter A. Businger, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 15, 1969, Ser. No. 885,049
Int. Cl. G06f *15/32*
U.S. Cl. 235—150 **10 Claims**

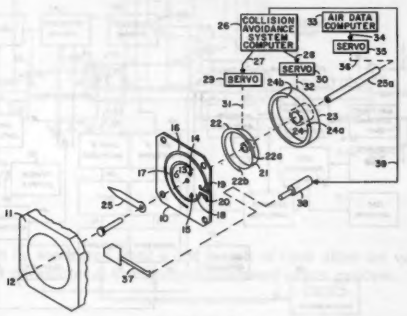


A method of insuring the numerical stability of the machine-implemented computational process of Gaussian elimination. The accuracy of the method of complete pivoting is substantially obtained without sacrificing the economy of the method of partial pivoting, except in those cases where it is essential to do so to preserve accuracy.

3,621,210
COMBINED PERFORMANCE AND COMMAND INDICATOR

Terry D. Canning, Marion, and Richard L. Jaycox, Cedar Rapids, both of Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Dec. 5, 1969, Ser. No. 882,579
Int. Cl. G08g *5/04*
U.S. Cl. 235—150.2 **12 Claims**

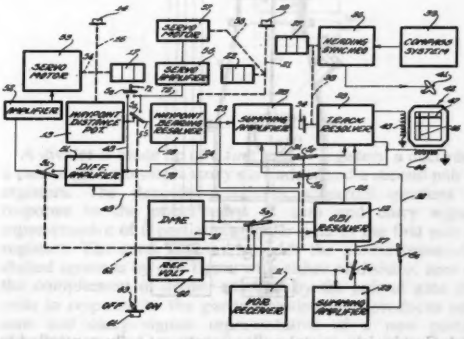


Visual annunciation of predetermined scale segments of a performance indicator of the type comprising a zero or reference index and performance indications either side of the reference is utilized to combine a dynamic visual command indication with a performance monitoring indication. Annunciation may be in the form of visual optical stimuli initiated at the extreme performance indices and caused to extend in length in juxtaposition with the scale towards and beyond the reference index to define command limits in terms of performance either side of the index. The command may be easily followed by the observer by control actions to keep the monitored performance out of the annunciated areas. A combined aircraft vertical speed and collision avoidance command indicator is exemplified.

3,621,211
AUTOMATIC TRACK

Earl Stuart Perkins, Oak Brook, Ill., assignor to Butler National Corporation, Oak Brook, Ill.

Filed Apr. 15, 1969, Ser. No. 816,302
Int. Cl. G06f *15/50*
U.S. Cl. 235—150.27 **10 Claims**



An aircraft navigation system which includes an area navigation apparatus capable of being set to selected way

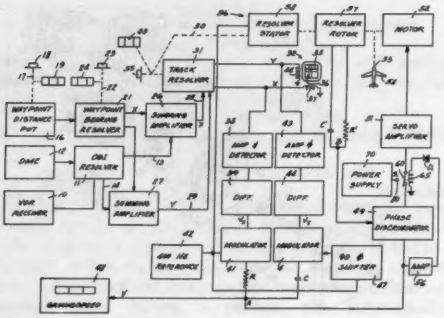
points with known bearings and distances from ground stations which includes an automatic track mode wherein an arbitrary way point along a selected track may be automatically chosen.

3,621,212

DIRECTION AND GROUND SPEED COMPUTER

James Hobbs, Overland Park, Kans.; Earl Stuart Perkins, Oak Brook, Ill., and Donald E. Floyd, Independence, Mo., assignors to Butler National Corporation, Minneapolis, Minn.

Filed Jan. 7, 1969, Ser. No. 789,433
Int. Cl. G06g *7/78*
U.S. Cl. 235—150.27 **11 Claims**



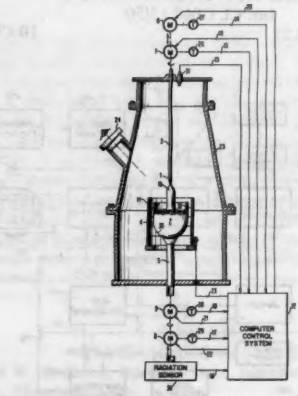
An aircraft heading and ground speed computer which utilizes the output of a way point computer and converts the X and Y distances to the way point to X and Y velocities and combines them to obtain the resultant ground speed. The track made good may also be obtained from the X and Y velocity components. A system for calculating the wind speed and direction is also disclosed.

3,621,213

PROGRAMMED DIGITAL-COMPUTER-CONTROLLED SYSTEM FOR AUTOMATIC GROWTH OF SEMICONDUCTOR CRYSTALS

Dian P. Jen, Hopewell Junction; Richard A. Slocum, Newburgh, and Carl R. Valentino, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,273
Int. Cl. G06f *15/46, 9/06*
U.S. Cl. 235—150 **3 Claims**



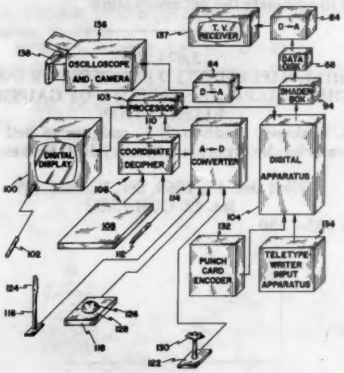
A Czochralski crystal puller is automatically controlled by a specially programmed digital computer to produce constant diameter, high-quality semiconductor crystals. Provision is made in the programming of the computer for the solution of partly theoretical and partly empirical mathematical models for simultaneously controlling heater temperature, crystal lift rate, crucible lift rate, crystal rotation rate and crucible rotation rate. Computer solutions of the equations are made in real time and the computer is an online integral component of the overall crystal growth system. The mathematical models concerned with heater temperature control and crystal lift control include data extrapolation for the anticipatory control of crystal diameter to compensate for the low dynamic response of the Czochralski crystal puller to changes in the heater control signals.

3,621,214

ELECTRONICALLY GENERATED PERSPECTIVE IMAGES

Gordon W. Romney, 1521 Princeton Avenue, Salt Lake City; David C. Evans, 1393 East South Temple, Salt Lake City; Alan C. Erdahl, 2277 East 1700 South, Salt Lake City, Utah, and Chris R. Wylie, deceased, late of Salt Lake City, Utah (Patricia A. Wylie, administratrix)

Filed Nov. 13, 1968, Ser. No. 802,702
Int. Cl. G06f *7/00, 9/12*
U.S. Cl. 235—151 **48 Claims**



A method and system for electronically generating and displaying two-dimensional perspective images which visually define three-dimensional objects by providing electrical signals representative of the surfaces of an object, converting, ordering and utilizing the signals to identify and display only visible surfaces and to control brightness along the visible surfaces of the eventual electronic display. More specifically, units of the electrical signals define surface portions of the object. These units are converted to define the projections of the surfaces defined by the units onto a two-dimensional image or view plane. The converted units are sorted to conform to the scanning pattern of the display device and those units which are to be visible, depending on the desired orientation of the object, are determined. The visual characteristics of the visible units are then calculated and converted to suitable form for controlling the intensity of the electronic display.

3,621,215

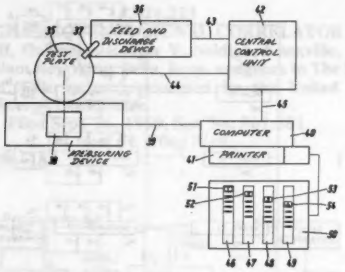
METHOD AND APPARATUS FOR SEQUENTIAL TESTING OF A PLURALITY OF SPECIMENS

Heinrich Netheler; Wilhelm Bergmann, and Gunter Bechtler, all of Hamburg, Germany, assignors to Eppendorf Geraetebau Netheler & Hinz GmbH, Hamburg, Germany

Filed May 5, 1969, Ser. No. 821,832
Claims priority, application Germany, May 9, 1968, P 17 73 390.3
Int. Cl. G01d *21/00*
U.S. Cl. 235—151.3 **9 Claims**

A method and apparatus are disclosed wherein a plurality of new specimens are introduced into a closed testing cycle

and the period of introduction of successive samples stand in a predetermined ratio to the duration of the testing cycle; but is different therefrom. There is continuous feeding and testing of samples sequentially and periodically, while samples are supplied and removed according to the introduction period. The apparatus for carrying out this method includes a



testing plate containing a number of specimen-retaining stations. This testing plate is rotated in relation to both a measuring station and a station or stations for feeding and extracting specimens to and from the various retaining stations. In addition, unique means are shown for recording the results of tests made in carrying out the method with the apparatus of the present invention.

3,621,216

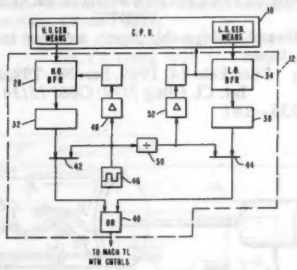
LINEAR INTERPOLATOR

Donald Wortzman, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 791,365, Jan. 15, 1969, now abandoned. This application June 30, 1969, Ser. No. 843,278

Int. Cl. G06f *7/38, 15/46*

U.S. Cl. 235—151.11 **19 Claims**



A system for interpolating data to generate a stream of pulses for controlling a machine tool or other precise mechanism. The interpolation is broken into a high-speed portion and a low speed portion. For a given straight line cut, the high-speed portion contains a fixed part and a variable part. The variable part of the high-speed portion is supplied by the low speed portion.

3,621,217

SPECIAL-PURPOSE PROCESS CONTROL COMPUTER

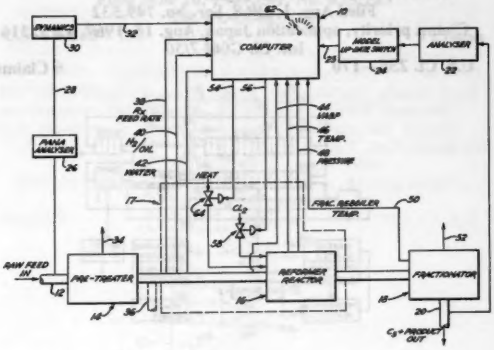
Norman L. Carr, Allison Park; Allen E. Somers, Pittsburgh, and Donald L. Stahlfeld, Glenshaw, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 9, 1969, Ser. No. 856,438

Int. Cl. G06g *7/58;* **G06f** *15/46*

U.S. Cl. 235—151.12 **9 Claims**

A process-controlling computer wherein an analytical instrument is provided and is used as a standard against which to calibrate the model of the process in the computer. The process is of such a nature that the key output parameter



cannot be measured until some length of time after the value of that parameter is internally determined in the process.

3,621,218

HIGH-SPEED DIVIDER UTILIZING CARRY SAVE ADDITIONS

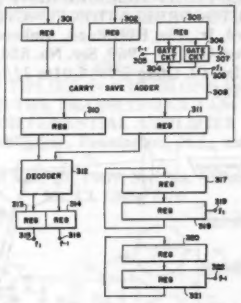
Tetsunori Nishimoto, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo-To, Japan

Filed Sept. 27, 1968, Ser. No. 763,286

Claims priority, application Japan, Sept. 29, 1967, 42/62331

Int. Cl. G06f *7/52*

U.S. Cl. 235—164 **4 Claims**

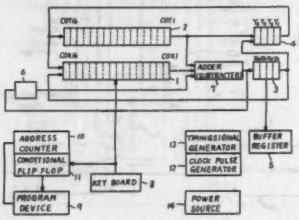


A divider is made up of a first pair of registers, a decorder, a pair of gate circuits, a carry save adder and a second pair of registers. The decorder produces a partial quotient in response to the upper parts of sum and carry signals representative of a partial remainder held in the first pair of registers. The carry save adder adds the partial remainder shifted upwards by one figure with either of divisior, zero or the complement of divisor selected by the pair of gate circuits in response to the partial quotient and produces new sum and carry signals representative of a new partial remainder to replace the previous partial remainder in the first pair of registers therewith. Thus the second pair of registers holds in succession the sequence of partial quotients produced by the decoder.

3,621,219
ARITHMETIC UNIT UTILIZING MAGNETIC CORE MATRIX REGISTERS

Isamu Washizuka, Osaka; Kunio Yoshida, Osaka; Akihiko Kunikane, Nara-ken, and Yoshinobu Kitagawa, Nara-ken, all of Japan, assignors to Hayakawa Denki Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 1, 1968, Ser. No. 749,532
Claims priority, application Japan, Aug. 15, 1967, 42/52316
Int. Cl. G06f 7/50
U.S. Cl. 235—170 6 Claims

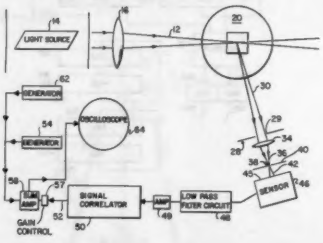


A compact computer of the serial type using magnetic memory devices as registers with one register being connected to an indicating device for immediate external indication. By using the memory devices in an improved manner with buffer registers, the alternative readout and storage procedures are avoided and addition or subtraction of binary coded decimal numbers can be performed during the readout period and thereby reduce processing time. The computer also enables the application of a correction signal to the adder or subtractor during write-in and does not require a separate binary adder or subtractor. Left and right shift operations are simplified and when the value stored in the memory device is read out starting with the most significant position, one flip-flop is set by the most significant digit and the output is fed to an indicating tube. This eliminates the need for indicating meaningless zeros.

3,621,220
SCATTERED LIGHT MEASUREMENT PROVIDING AUTOCORRELATION FUNCTION

Norman C. Ford, Jr., Flat Hills Road, Amherst, Mass.

Filed Aug. 29, 1969, Ser. No. 854,175
Int. Cl. G06g 7/19; G01m 21/00
U.S. Cl. 235—181 5 Claims

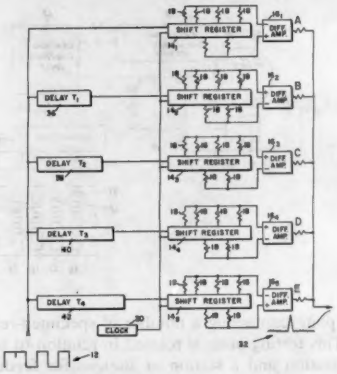


A method for measuring the diffusion constant of a macromolecule moving in a medium, e.g., in solution or suspension, comprising direction, at a sample of a macromolecule-containing medium, an incident light beam having a coherence length which is long compared to sample size, collecting light scattered by the macromolecular sample at an angle θ to the incident light beam in a sensor capable of producing a first electrical signal dependent upon the change in intensity of the collected light with time, and having a component due to scattering of light by said macromolecules, computing the autocorrelation function of said component, and producing a second electrical signal related to said autocorrelation function.

3,621,221
CORRELATOR WITH EQUALIZATION CORRECTION

Alfred J. Cann, Westford, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 11, 1968, Ser. No. 782,987
Int. Cl. G06f 15/34; H04b 3/04
U.S. Cl. 235—181 2 Claims

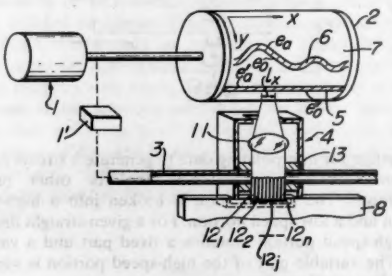


Apparatus is herein disclosed for providing in a code system correlation in conjunction with equalization correction to reduce the higher sidelobes which appear for certain autocorrelation functions. The signal to be correlated is applied to a shift register or tapped delay line, whose tap outputs are summed with various polarities and weightings to accomplish, simultaneously, correlation and equalization.
The invention herein described was made in the course of or under a contract or subcontract thereunder with the Department of the Navy.

3,621,222
DATA PROCESSING SYSTEM FOR CURVES RECORDING ON CHARTS WHOSE TRACE VARIES IN WIDTH

Shigeo Minami, Ashiya-shi, Japan, assignor to Hatachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1969, Ser. No. 799,428
Int. Cl. G06g 7/19; G06f 15/34
U.S. Cl. 235—181 9 Claims



A data processing system for curves recorded on charts wherein a straight line $y=a$ (constant) and a curve $y=f_1(x)$ are recorded, the curves having a certain width.
Variations in reflected light are detected by photoelectric transducer elements and converted into electrical signals.
A sequence of rectangular waves having widths equal to intervals between an electric signal corresponding to the position of the line $y=a$ and electric signals corresponding to the position of the curve $y=f_1(x)$ are obtained from the photoelectric transducer elements by rotating the chart in a y-direction and by scanning with an optical head, including a light source and photoelectric transducer elements, in an x-

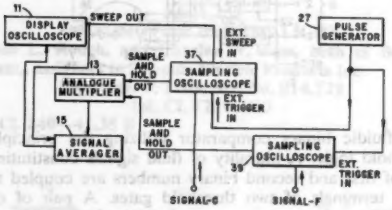
direction; the sequence of rectangular waves are applied to a summing integrator and its output to a display device, whereby a new curve proportional to the average position of both edges of the curve $y=f_1(x)$ is obtained; when weighting the rectangular waves according to a function $y=f_2(x)$, a new curve is obtained which corresponds to the convolution of the functions $f_1(x)$, $f_2(x)$.

3,621,223

HIGH-FREQUENCY SIGNAL CORRELATOR

Igor Alexeff, Oakridge; Rodger V. Neidigh, Knoxville, Tenn., and William Ray Wing, Pella, Iowa, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 26, 1969, Ser. No. 861,381
Int. Cl. G06g 7/19
U.S. Cl. 235—181 **1 Claim**



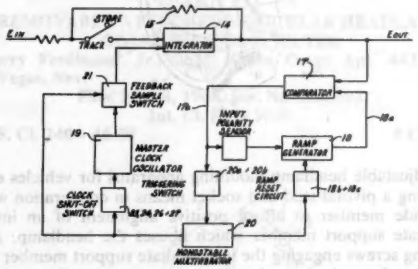
An automatic frequency correlator computes auto and cross correlation functions of up to 3 GHz. bandwidth over 100 sampling points. The frequency response of the correlator of the present invention is an improvement of three orders of magnitude over that obtainable by prior art correlators, and this is accomplished by providing a new and more convenient means of generating the necessary delay times in the operation of the present correlator.

3,621,224

ELECTRONIC TRACK AND STORE DEVICE

Robert E. Friday, Overland Park, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Sept. 30, 1969, Ser. No. 862,362
Int. Cl. G06g 7/18
U.S. Cl. 235—183 **10 Claims**



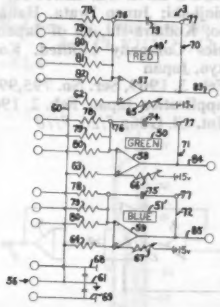
An electronic device for tracking and/or storing an electrical voltage level that utilizes an analog integrator, with an associated switch for performing track and initial storage. A hybrid feedback system prevents drift in the integrator output by utilizing the time required for a periodic fixed-rate pump signal to rise to the level of the integrator output signal. This time is used to determine the number of cycles from a fixed-frequency oscillator that occur in that time period. Deviations in the number of cycles (or portions of a cycle) occurring in the time interval are used to generate an error signal which is fed back to the integrator to correct for integrator voltage drift thereby causing the output of same to seek a quantum but stable value.

3,621,225

ELECTRICAL APPARATUS FOR OBTAINING PRINTING LIGHT INTENSITY VALUES

John V. Hanline, Kansas City, Mo., and Daniel M. Chapin, Shawnee Mission, Kans., assignors to Film Equipment Manufacturing Co., Kansas City, Mo.

Filed June 20, 1969, Ser. No. 835,143
Int. Cl. G06g 7/48
U.S. Cl. 235—193 **9 Claims**



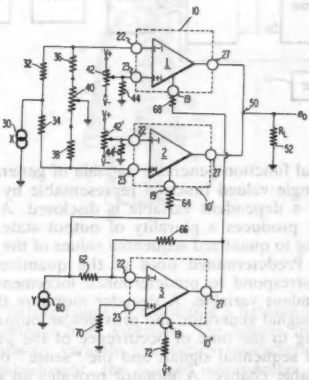
Electrical apparatus for obtaining light intensity values for printing lights for use with a production color film by comparing density values of a standard color film and light intensity values for printing lights for use with the standard color film with density values of the production color film, said apparatus having visual indicators for displaying the obtained light intensity values for the printer lights for the production color film. A computation circuit is electrically connected to the visual indicators and to a standard color film circuit and to a standard lamp level circuit and to a production color film circuit for electrically processing signals from a plurality of potentiometers in the respective circuits. The signals represent density values associated with the standard color film and the production color film and light intensity values associated printer lights for the standard color film whereby when the computation circuit is activated, numerical intensity values for the printer lights for the production color film are displayed by the visual indicators. A conversion circuit is electrically connected to the computation circuit for producing signals in selected increments of printer light intensities.

3,621,226

ANALOG MULTIPLIER IN WHICH ONE INPUT SIGNAL ADJUSTS THE TRANSCONDUCTANCE OF A DIFFERENTIAL AMPLIFIER

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation

Filed Nov. 21, 1969, Ser. No. 878,650
Int. Cl. G06g 7/16
U.S. Cl. 235—194 **11 Claims**



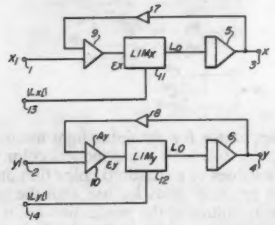
An input signal representing one quantity X is applied to two amplifiers for producing an output signal proportional to

the difference of the transconductance of the respective amplifiers and the amplitude of the signal. A second input signal representing a second quantity Y is employed to adjust the transconductance of the two amplifiers in a sense and amount such that the net output signal formed by the sum of the two output signals they produce is proportional to the product of X and Y.

3,621,227
ANALOG LINE GENERATOR

Junji Tsuda, Hachioji-shi; Junzo Iwata, Hanamaki-shi, and Chikafusa Hirano, Kodaira-shi, all of Japan, assignors to Hitachi Electronics Company Limited, Kodaira-shi and Hitachi Ltd., Tokyo, Japan

Filed Feb. 3, 1969, Ser. No. 795,997
Claims priority, application Japan, Feb. 2, 1968, 43/6005
Int. Cl. G06g *7/26, 7/18*
U.S. Cl. 235—197 **9 Claims**

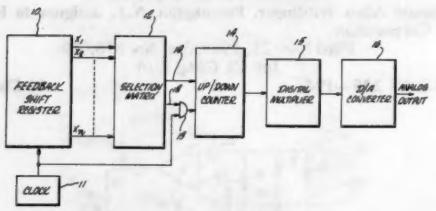


In an analog line generator for producing a straight line connecting two given points, which comprises an integrator, an adder and a feedback circuit from the integrator to the adder, an improvement comprising the provision of a limiter between the adder and the integrator to realize the line generation with higher accuracy and at higher speed.

3,621,228
DIGITAL FUNCTION GENERATOR

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Marvin Perlman, Granada Hills, Calif.

Filed Sept. 24, 1969, Ser. No. 860,750
Int. Cl. G06g *7/26*
U.S. Cl. 235—197 **3 Claims**

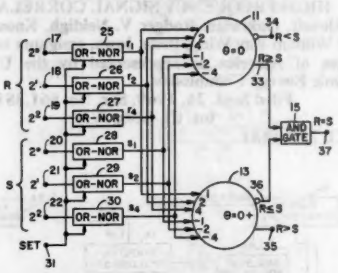


A digital function generator capable of generating any arbitrary single valued function representable by an independent and a dependent variable is disclosed. A state signal generator produces a plurality of output state signals corresponding to quantized sequential values of the independent variable. Predetermined ones of the quantized sequential signals correspond to predetermined incremental values of the dependent variable. A decoder monitors the output of the state signal generator and provides an output signal corresponding to the time of occurrence of the predetermined quantized sequential signals and the "sense" of the dependent variable change. A monitor provides an output signal which varies as a function of the decoder output. A digital-to-analog converter converts the monitor output to an analog signal representative of the function.

3,621,229
FLUIDIC BINARY COMPARATOR UTILIZING THRESHOLD GATES

Herbert M. Eckerlin, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,439
Int. Cl. G06m *1/08*
U.S. Cl. 235—201 PF **7 Claims**

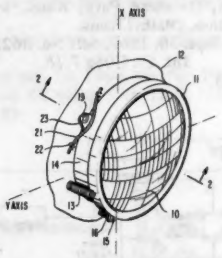


A fluidic binary comparator utilizing the principles of threshold logic. A plurality of fluid signals constituting the bits of first and second binary numbers are coupled to the input terminals of two threshold gates. A pair of output signals from the two gates are indicative of inequalities of the two binary numbers. Other output signals from the two threshold gates are coupled to an AND gate which produces a fluid output signal when the two binary numbers are equal.

3,621,230
HEADLAMP-MOUNTING MEANS

Henry R. Dwight, 220 Calhoun St., Charleston, S.C.

Filed Feb. 12, 1970, Ser. No. 10,731
Int. Cl. B60q *1/00*
U.S. Cl. 240—7.1 **9 Claims**



Adjustable headlamp-mounting apparatus for vehicles employing a pivotal stud and socket means in cooperation with a guide member to afford positive alignment of an intermediate support member which houses the headlamp. Adjusting screws engaging the intermediate support member act against the main mounting plate to change headlamp alignment through movement of the pivotal stud and socket means.

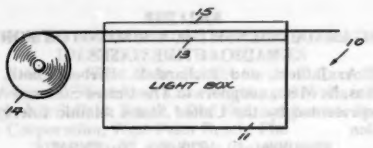
3,621,231
ANTIGLARE LIGHT BOX

Dwin R. Craig, Gaithersburg, Md., assignee to Elton Brown Brown, Jr., Washington, D.C.

Filed Mar. 10, 1969, Ser. No. 805,693
Int. Cl. F21 ; G02b *5/30*
U.S. Cl. 240—9.5 **3 Claims**

An antiglare light box is provided having a pair of right angularly disposed linear polarizers arranged in spaced relation over the lights of the light box. The material being viewed is positioned between the linear polarizers and printed on a

base which either possesses optical activity such that it will rotate the planes of polarization of the lowermost polarizer 90° so that the light will then pass through the second



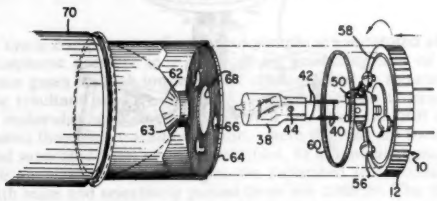
polarizer, or is a depolarizer and depolarizes the light from the first polarizing screen so that it can pass through the second polarizing screen.

3,621,232

AUTOMOTIVE DRIVING LIGHT

Harold L. Hough, and Charles W. Foss, both of Beverly, Mass., assignors to Sylvania Electric Products Inc.

Filed Apr. 9, 1969, Ser. No. 814,729
Int. Cl. F21v *7/00*
U.S. Cl. 240—41.35 R **1 Claim**



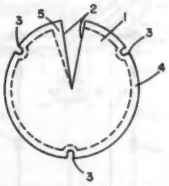
A removable weatherproof socket cover for an automotive lighting fixture is herein described. The removable cover supports a harness that optically aligns a baseless lamp that is retained therein. The harness is such that it regulates the lamp axially and symmetrically in relation to a reflector. In combination with spaced-apart locking studs and gasket, the socket cover can be attached to the fixture body and retained in a weatherproof sealed position.

3,621,233

REMOVABLY ATTACHED VEHICULAR HEADLAMP GLARE-DIFFUSING FILTER

Harry Ferdinand, Jr., 2635 Karen Court Apt. 442, Las Vegas, Nev.

Filed Nov. 8, 1968, Ser. No. 784,502
Int. Cl. F21v *9/08*
U.S. Cl. 240—46.59 **5 Claims**



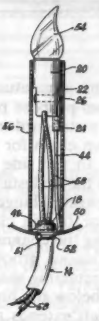
A removably attached vehicular headlamp glare-diffusing filter comprises a flat and generally circular piece of light-diffusing moistureproof material having an outer peripheral edge and a notch extending from the outer peripheral edge to the approximate center of the piece forming two substantially straight edges which converge at the approximate center, a plurality of spaced peripheral cutouts and a moistureproof adhesive along the outer peripheral edge of the piece and long one edge of the notch. When applied to a headlamp lens, the filters form a shallow cone-shaped configuration, readily adaptable to the concave face of any vehicular headlamp.

3,621,234

MOUNTING ELECTRICAL SOCKETS FOR A LIGHTING FIXTURE

Robert S. Fremont, Wilmette, Ill., assignor to Halo Lighting Division, a Division of McGraw Edison Company, Rosemont, Ill.

Filed Nov. 19, 1969, Ser. No. 878,008
Int. Cl. F21V *21/12*
U.S. Cl. 240—52.4 **7 Claims**



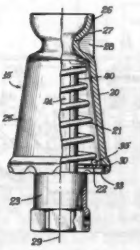
A mounting for an electrical socket for a lighting fixture whereby the socket is provided with an attachment clip, permitting it to be readily locked with a support bracket of any length, which support bracket is secured to an arm of a lighting fixture. This arrangement permits support brackets of any desired length to be used to provide the required support length.

3,621,235

RESILIENT LIGHTING FIXTURE HANGER

Arthur I. Appleton, c/o Appleton Electric Co., 1701 W. Willington, Chicago, Ill.

Filed Mar. 24, 1969, Ser. No. 809,525
Int. Cl. F21v *15/04*
U.S. Cl. 240—90 **5 Claims**



A lighting fixture hanger for isolating a lighting fixture depending therefrom from vibration, the hanger including a cushion displaying variable rate spring characteristics. In a preferred embodiment, the hanger incorporates a conical spring which can easily and quickly be captivatively assembled into a subassembly forming the essential functional portions of the hanger.

3,621,236
CONVERTIBLE SECUREMENT APPARATUS FOR SECURING STANDARD CONTAINERS AND NONSTANDARD CARGO ON VEHICLES

Emil J. Hlinsky, Oakbrook, and Allen D. Siblik, Mundelein, both of Ill., assignors to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

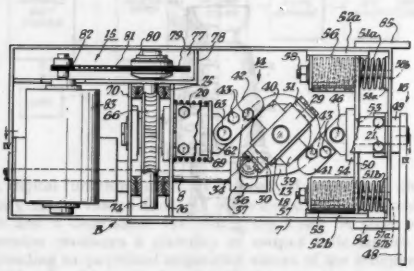
Filed May 15, 1970, Ser. No. 37,502
Int. Cl. B60p *7/08*
U.S. Cl. 296—35 A **17 Claims**

Convertible securement apparatus for a flatbed vehicle such as a trailer unit. Dual purpose pedestal has a twist lock for the corner casting of a standard transportation container; and a winch for a tiedown chain for miscellaneous cargo. A special channel is fixed to the side of the vehicle bed. A hinge pin is connected to the pedestal by a narrow link and is loosely retained in an elongated hinge pin retaining space extending along the interior of the channel. The pedestal is movable fore and aft along the channel when its link is within an upwardly open, continuous groove, providing access to the elongated hinge pin retaining space. The channel has an elongated compartment below the hinge pin retaining space, separated by a wall which extends along the length of the channel, the wall having notches at a series of locations along the channel. These notches are wider than the link carried by the pedestal, thus, when the pedestal is aligned with one of the notches, it can be pivoted about the hinge pin and movable from one to the other of the following operable positions:
a. A container-locking position with the pedestal seated upright on a horizontal extension of the deck of the flatbed vehicle, and with the twist lock upright to engage a container, and
b. a cargo tiedown position with the pedestal upside down in the channel compartment below the hinge pin retaining space, and with the winch in position to engage a cargo tiedown chain.

3,621,237
TRAILABLE RAILWAY SWITCH MACHINE

Lyle L. Hylen, Wilkinsburg, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Sept. 18, 1969, Ser. No. 859,043
Int. Cl. B61l *5/06*
U.S. Cl. 246—411 **11 Claims**

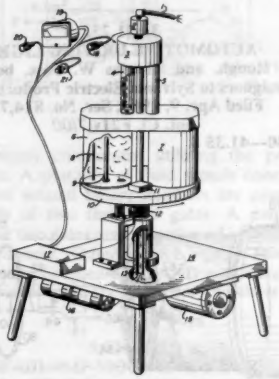


This disclosure relates to a trailable railway switch machine for use in classification yards and the like for moving the switch points between their two extreme positions. The switch machine includes a motion-translating mechanism having a hand-throw toggle, a motor toggle and a crank arm. A hand-throw lever connected to the hand-throw toggle, an electric motor connected to the motor toggle and the switch points connected to the crank arm so that rotary motion is only imparted to the crank arm when the hand-throw lever is manipulated or when the electric motor is energized and reciprocating movement is imparted to the hand-throw toggle and motor toggle when the switch is trailed.

3,621,238
GAMMA INSENSITIVE AIR MONITOR FOR RADIOACTIVE GASES

Roland A. Jalbert, and Richard D. Hiebert, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 10, 1970, Ser. No. 71,042
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 FT **2 Claims**

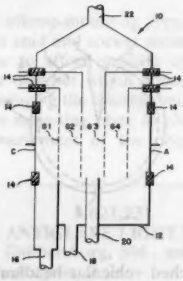


An ionization chamber instrument for measuring the concentration of radioactive gases in air is described. External gamma radiation effects on the instrument are eliminated through use of a compensating chamber mounted next to the measuring chamber with both chambers orbiting about a common axis.

3,621,239
DETECTING A TRACE SUBSTANCE IN A SAMPLE GAS COMPRISING REACTING THE SAMPLE WITH DIFFERENT SPECIES OF REACTANT IONS

Martin J. Cohen, West Palm Beach, Fla., assignor to Franklin Gro Corporation, West Palm Beach, Fla.

Filed Jan. 28, 1969, Ser. No. 794,741
Int. Cl. B01d *59/44*; **H01j** *39/34*
U.S. Cl. 250—41.9 TF **4 Claims**



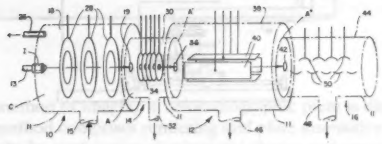
Methods for sorting and detecting trace gases which undergo ion-molecule reactions. Particular species of reactant ions are selected by choice of reagent gas and/or by reactant ion filtering to produce predictable product ions by reaction with trace gas molecules of a sample. The sample may be reacted with different species of reactant ions and the results

compared to confirm the presence of particular species of product ions. The reagents producing different species of reactant ions may have ionization potentials above and below the ionization potential of the expected trace gas molecules.

3,621,240
APPARATUS AND METHODS FOR DETECTING AND IDENTIFYING TRACE GASES

Martin J. Cohen, West Palm Beach; David I. Carroll, Lantana; Roger F. Wernlund, Lake Worth, and Wallace D. Kilpatrick, North Palm Beach, all of Fla., assignors to Franklin Gro Corporation, West Palm Beach, Fla.

Filed May 27, 1969, Ser. No. 828,402
Int. Cl. H01j 39/36
U.S. Cl. 250—41.9 G 34 Claims

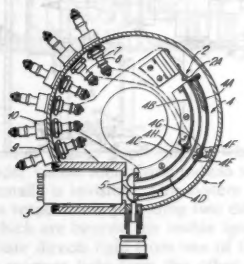


Trace components of a gaseous sample are separated at atmospheric pressure in a drift cell by producing ions of the trace gases through ion-molecule reactions and by separating the resultant product ions in accordance with drift velocity. A molecular beam, including product ions from the drift cell, passes through a transition region, where the ions are focused and separated from neutral molecules, to a mass analyzer. In the analyzer, the product ions are separated in accordance with mass and selectively passed to an ion counter. The mass analyzer and ion counter are maintained at high vacuum.

3,621,241
ELECTROSTATIC ANALYZERS WITH AUXILIARY FOCUSING ELECTRODES

David W. Turner, Headington, England, assignor to Perkin-Elmer Limited, Beaconsfield, Buckinghamshire, England

Filed Oct. 7, 1969, Ser. No. 864,458
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 ME 8 Claims

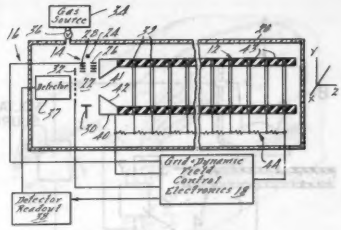


An electrostatic analyzer of the energy spectrum of charged particles is provided comprising spaced apart analyzer plates adapted for operation in a velocity-focusing mode of operation and auxiliary electrode means adjoining an inner face of an analyzer plate. Circuit means apply a potential to each analyzer plate and a potential of opposite polarity to an associated auxiliary electrode means for establishing an electrostatic field between the plates which in a zone of influence of the auxiliary electrode means is modified to direct peripheral particle trajectories towards a focus substantially common with that of paraxial trajectories.

3,621,242
DYNAMIC FIELD TIME OF FLIGHT MASS SPECTROMETER

Lowell D. Ferguson, Bloomfield Hills, and John P. Carrico, Royal Oak, both of Mich., assignors to The Bendix Corporation

Filed Dec. 31, 1969, Ser. No. 889,436
Int. Cl. H01j 39/36
U.S. Cl. 250—41.9 DS 47 Claims

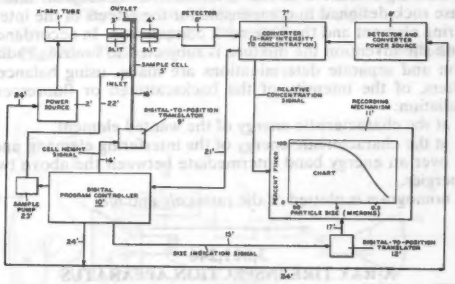


A time-of-flight mass spectrometer which employs a dynamic electric field to accelerate charged particles. For a sample containing various charged particles and given field parameters, each mass-to-charge specie of the sample has associated with it a unique flight time in the dynamic field. This flight time is derived from the interaction of the charged particles with the dynamic field. Various particles are resolved according to their mass-to-charge ratios by recording differences in their flight times in the dynamic electric field.

3,621,243
APPARATUS AND PROCESS FOR DETERMINING PARTICLE SIZE BY X-RAY ABSORPTION ANALYSIS

James Peter Olivier, and George Keller Hickin, both of Macon, Ga., assignors to Freeport Sulphur Company, New York, N.Y.

Continuation-in-part of application Ser. No. 618,841, Jan. 23, 1967, now Patent No. 3,449,567, dated June 10, 1969. This application Apr. 16, 1969, Ser. No. 816,649
Int. Cl. G01n 23/12
U.S. Cl. 250—43.5 11 Claims



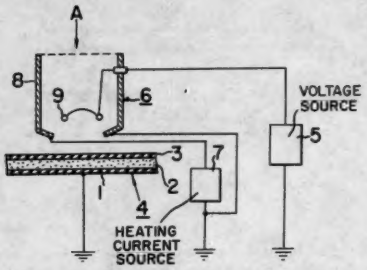
An apparatus and process for measuring and automatically recording the particle size distribution of material in fluid suspension, which is based on the application of laws of sedimentation, and which uses a digital-programmed controller. A beam of X-rays is used to measure particle concentration in terms of the transmittance of the beam in the suspension relative to the suspending fluid. This transmittance measurement is continuously converted to a quantity proportional to the concentration of suspended material in the X-ray beam at a particular instant. The programmed digital controller continuously decreases the sedimentation distance while at the same time continuously positioning a recorder to indicate the particle size being measured at that time. The use of a digital program controller provides for a high degree of accuracy and reliability.

3,621,244

CORONA DISCHARGE DEVICE WITH MEANS TO HEAT THE DISCHARGE ELECTRODES TO INCREASE THE DISCHARGE CURRENT

Seiichi Miyakawa, Nagareyama-shi, Japan, assignor to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed June 24, 1969, Ser. No. 836,024
Int. Cl. G03g *15/00*
U.S. Cl. 250—49.5 4 Claims



In a corona discharge device utilized in electrophotography, means to heat directly or indirectly the corona discharge electrode is provided to increase corona discharge current.

3,621,245

METHOD OF X-RAY FLUORESCENCE ANALYSIS OF MATERIALS CONTAINING AN INTERFERING ELEMENT

Colin Geoffrey Clayton, Abingdon, England, and Bohdan Wladyslaw, Krakow, Poland, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 8, 1968, Ser. No. 719,610
Claims priority, application Great Britain, Apr. 28, 1967, 19,833/67
Int. Cl. G01n *23/22*
U.S. Cl. 250—51.5 4 Claims

The invention discloses a method of analysis of a mixture containing a wanted element, an interfering element and a base rock designed to compensate for the effects of the interfering element and the base rock composition. In accordance with the invention the mixture is subjected to ionizing radiation and separate determinations are made, using balanced filters, of the intensity of the backscattered or fluorescent radiation:

a. at the characteristic energy of the wanted element,
b. at the characteristic energy of the interfering element, and
c. over an energy band intermediate between the above two energies.

A nomogram is plotted of the ratios *a/c* and *b/c*.

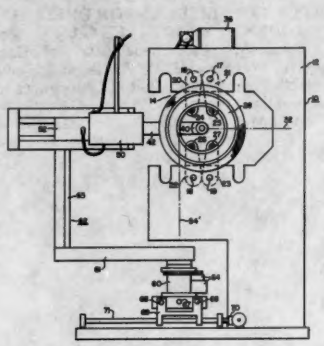
3,621,246

X-RAY TIRE INSPECTION APPARATUS

William C. Horsey, Baltimore; Robert H. Samson, Pasadena, and Don O. McCauley, Glen Burnie, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 14, 1970, Ser. No. 71,931
Int. Cl. G03b *41/16*
U.S. Cl. 250—52 10 Claims

Apparatus for the complete X-ray inspection of a tire is described. Power-operated spindles arranged oppositely along an open-ended clearanceway in a supporting frame, spread the beads of the tire and rotate it about its center. An angulated X-ray tube on one end of a curved inspection arm directs an X-ray beam into the opening between the tire beads in direct alignment toward an image amplifier tube and TV camera assembly on the opposite end of the inspection arm at the tire's exterior. An L-shaped pivot support arm for the inspection arm provides for aiming the X-ray beam at different angles into the tire from one bead to the other, while the image tube is maintained in direct alignment with such beam. A TV monitor produces visible images responsively to output from the TV camera on the inspection arm.

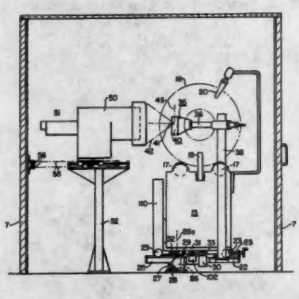


3,621,247

X-RAY TIRE INSPECTION APPARATUS

Basil M. Lide, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 14, 1970, Ser. No. 71,932
Int. Cl. G03b *41/16*
U.S. Cl. 250—52 6 Claims



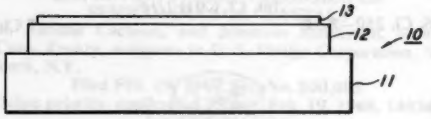
Apparatus for the complete X-ray inspection of a tire is described. An X-ray tubehead with a reversible-motor-operated tube insert turnable about a vertical axis, is disposed within the tire to aim a small-focal-spot X-ray beam horizontally outward through the tire from the center of its cross section in a series of directions ranging from bead to bead, and the tire is turned by a manipulator at least a full revolution about its normal axis of rotation in each pointing direction of the beam. The manipulator and the X-ray tubehead are mounted on a common base, motor operated to turn about the same axis as that of the X-ray tube insert, to maintain registry of the tire-exiting X-ray beam with an image amplifier-TV camera assembly.

3,621,248

METHOD OF USING A XERORADIOGRAPHIC PLATE WHICH IS INSENSITIVE TO VISIBLE LIGHT

Paul J. Regensburger, West Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 527,904, Feb. 16, 1966, Patent No. 3,501,343.
Filed June 25, 1969, Ser. No. 870,975
Int. Cl. G03g 13/22, 5/04
U.S. Cl. 250—65 ZE 4 Claims



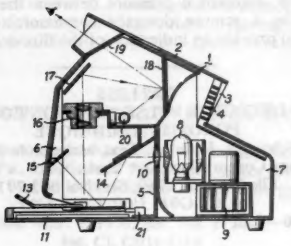
A method of imaging a xeroradiographic plate is disclosed. The method comprises rendering said plate insensitive to visible light by applying an electrostatic charge and exposing the plate to X-ray radiation to form an electrostatic charge pattern.

3,621,249

VIEWER FOR IDENTIFICATION SYSTEMS

Tomichi Kikumoto, Kashiwa-shi, Japan, assignor to Eizo Komiyama, Ichikawa-shi, Chiba-ken, Japan

Filed Sept. 9, 1969, Ser. No. 856,285
Claims priority, application Japan, Sept. 19, 1968, 43/80805
Int. Cl. G01n 21/34
U.S. Cl. 250—71 R 6 Claims



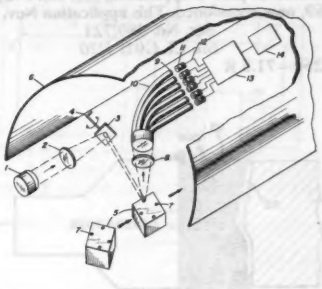
An identification system according to which it becomes possible to render visible identifying indicia such as a signature which normally is invisible. This system includes a pair of light sources respectively providing two different types of light both of which are beyond the visible spectrum. A light-directing structure directs light from one of these sources to an area which receives light from the other of the sources. This light-directing structure reflects light of the first source from an article which has thereon identifying indicia which absorbs light from this one, first source, so that the area to which the light is directed will receive light from the one source except for the light which is absorbed by the identifying indicia. At the area which receives light from both of the sources there is located a fluorescent plate which is rendered fluorescent when receiving light from the second or other source and which is rendered nonfluorescent when receiving light from the one, first source. As a result the fluorescent plate fluoresces only at an area the configuration of which corresponds to the configuration of the identifying indicia, so that the latter becomes visible at that part of the fluorescent plate which fluoresces.

3,621,250

CODING OF SYMBOLS WITH PHOTOLUMINESCENT MATERIALS FOR READOUT TO OBTAIN PROPER SEQUENCE SIGNAL READOUT FROM RANDOM READING OF SYMBOLS

Hanns J. Wetzstein, Wayland, Mass., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 22, 1970, Ser. No. 39,723
Int. Cl. G01j 3/06
U.S. Cl. 250—71 R 5 Claims



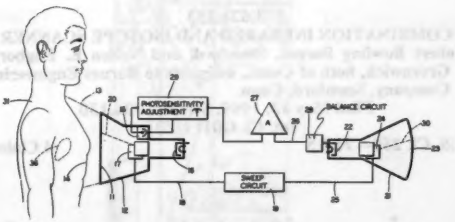
Coded inks are described having one or more photoluminescent components to represent different symbols which can then be read out by ultraviolet illumination. For example, six components can represent 63 different symbols by their presence or absence in a mark. A set of components is divided into two groups, for example, four and two in the case of six components. The four components are sufficient to generate 15 different symbols, for example, more than enough to represent 10 digits. These symbols are printed in four spatially separated small marking areas which may be circles or squares. Four dots, if arranged sequentially can represent the numbers 0 to 9,999; however, their sequence has to be known. The other group of components, for example two is incorporated into the marks to define the intended sequence of symbols regardless of the actual sequence in which marks are read.

3,621,251

ELECTRONIC RADIOACTIVE SENSING AND SCANNING DEVICE

Jack E. Slingluff, 5424 Peninsula Drive, N.W., Canton, Ohio

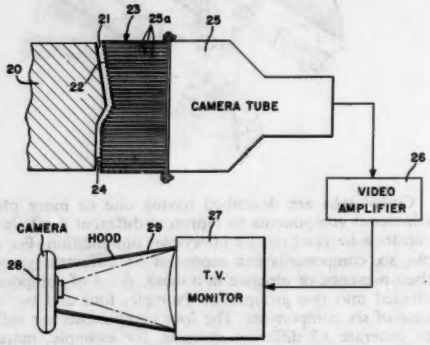
Filed Apr. 16, 1969, Ser. No. 816,663
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 3 Claims



An observer's cathode-ray tube is provided with a cathode-ray beam generator connected to a circuit responsive to light produced on the surface of a radiosensitive light-producing member in response to the conjoint effect of radiation to be observed and a beam such as a cathode-ray beam, caused to sweep the surface of the radiosensitive light-producing unit. The circuit is so adjusted that the beam of the observer's cathode-ray tube is intense enough to produce a light spot on its screen only when the radiosensitive light-producing sheet is exposed to radiation to be observed. Sweep circuits are provided which are synchronized so that beams sweep the light-producing surface and the screen of the observer's

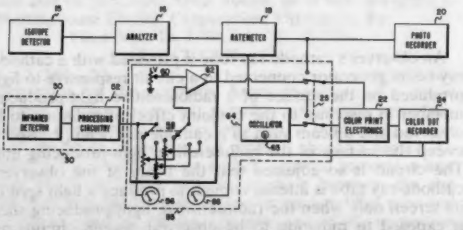
cathode-ray tube in the same pattern. Consequently, the configuration of radiation reaching the radiosensitive, light-producing sheet is reproduced on the screen of the observer's cathode-ray tube and the observation may be made at a distance from the source of radiation to be observed.

3,621,252
PROCESS AND APPARATUS FOR DEFECT DETECTION USING A RADIOACTIVE ISOTOPE
William C. Eddy, Jr., Columbus, Ohio, assignor to Industrial Nucleonics Corporation
Continuation-in-part of application Ser. No. 875,400, Nov. 10, 1969, now abandoned. This application Nov. 28, 1969, Ser. No. 880,721
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R **18 Claims**



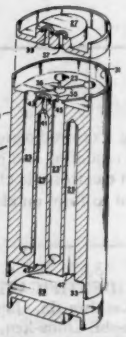
Detection of defects such as cracks, and the like, is accomplished by effecting adsorption of an inert gas radioisotope, e.g., krypton–85, onto the surface to be examined followed by obtaining a visible image of the radioactivity level pattern prior to desorption of the adsorbed gas. Prior to adsorption, the surface is outgassed to remove occluded gases, followed by exposure the the inert radioactive gas at essentially ambient temperature and pressure in the range of 2mm Hg to one atmosphere above 760mm. Hg. Visible images are obtained by use of fiber optics in bundle form, the fibers coated with a phosphor which emits light when exposed to the inert gas radioisotope. The bundle of fibers has a front face which conforms to the surface of the part examined, the light output being fed to a video camera whose output signal is amplified and displayed on a video display device.

3,621,253
COMBINATION INFRARED AND ISOTOPE SCANNER
Robert Bowling Barnes, Stamford, and Nelson E. Engborg, Greenwich, both of Conn., assignors to Barnes Engineering Company, Stamford, Conn.
Filed May 13, 1969, Ser. No. 824,130
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 S **4 Claims**



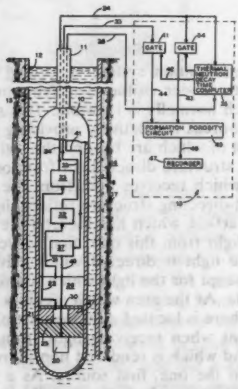
An isotope scanner is provided with an infrared capability by attaching an infrared radiometer on the scintillation probe containing the scintillation detector and using the scanning system of the isotope scanner to simultaneously scan the patient with the radiometer and the scintillation detector. The display equipment of the isotope scanner is utilized simultaneously by the isotope detector and the radiometer to provide a simultaneous infrared and isotope display of the patient under study. The isotope scanner and the infrared radiometer may also be used independently of each other.

3,621,254
DIFFERENTIAL PRESSURE NUCLEAR RADIATION FLUX DETECTOR
Casimer J. Borkowski, Oak Ridge, Tenn.
Filed Apr. 22, 1970, Ser. No. 30,715
Int. Cl. G01t *1/16*
U.S. Cl. 250—83 R **7 Claims**



A radiation flux detector has been provided which includes a pair of chambers, each filled with a different gas and each sensitive and nonsensitive, respectively, to the flux being measured, located in the flux of interest. The pressure in the chamber filled with the sensitive gas changes at a faster rate than in the other chamber in the presence of the radiation flux and the differential pressure between the chambers is measured by a remote detector communication with the chambers to provide an indication of the flux density.

3,621,255
TWO DETECTOR PULSE NEUTRON LOGGING POROSITY TECHNIQUE
Robert J. Schwartz, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Oct. 2, 1969, Ser. No. 863,771
Int. Cl. G01t *3/00*; G01v *5/00*
U.S. Cl. 250—83.1 **3 Claims**



An illustrative embodiment of the invention discloses a technique for reducing the influence of borehole charac-

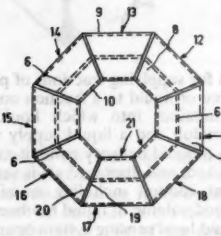
teristics on earth formation porosity measurements. Measurements of this sort are accomplished with a borehole logging tool that comprises two neutron detectors spaced at different distances from a pulsed neutron generator. The thermal neutron decay time of the short-spaced detector identifies that portion of the time-dependent population that is most indicative of the formation porosity. Both detectors then register the portion of the neutron distribution so identified to produce two signals from which a ratio is computed that is related to the porosity of the formation.

3,621,256

POLYGONAL-SHAPED RADIATION DETECTOR EMPLOYING PLURAL PRISM-SHAPED SEMICONDUCTOR CRYSTALS

Jean Antoine Cacheux, and Johannes Meuleman, both of Caen, France, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,405
Claims priority, application France, Feb. 19, 1968, 140341
Int. Cl. G01t *1/24*
U.S. Cl. 250—83 **6 Claims**



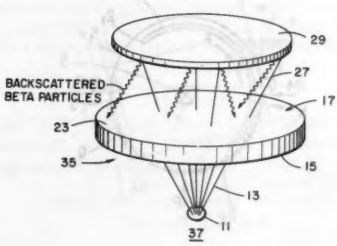
The invention relates to a semiconductor detector for measuring and/or detecting ionizing radiation, having a large sensitive volume, particularly for gamma spectrometry.

3,621,257

BETA PARTICLE DETECTION IN THIN NUCLEAR DETECTORS

Phillip A. Johnston, and Vincent L. Gelezunas, both of King of Prussia, Pa., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 9, 1970, Ser. No. 17,403
Int. Cl. G01t *1/24*
U.S. Cl. 250—83 R **5 Claims**



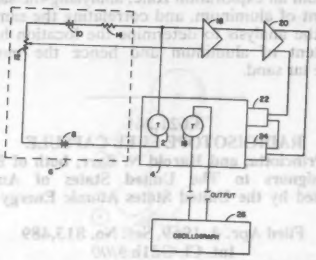
Detector for beta particles having means for scattering particles back into the detector.

3,621,258

PELTIER-CONTROLLED BOLOMETER TEMPERATURE REFERENCE TECHNIQUE

David R. Dreitzler, Huntsville; Lawrence B. Thorn, Madison, and Roy E. Yell, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 18, 1970, Ser. No. 20,762
Int. Cl. G01j *1/16*
U.S. Cl. 250—83.3 H **2 Claims**



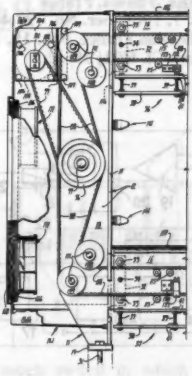
Means for stabilizing the thermal operating point of a thermistor bolometer, wherein the detector block on which the thermistors are mounted is maintained at a predetermined temperature. The compensating thermistor mounted on the detector block is connected in a Wheatstone Bridge configuration to thereby cause a signal to be generated which causes Peltier heating or cooling of the block as the situation requires.

3,621,259

SHEET-GAUGING APPARATUS

Mathew G. Boissevain, Los Altos Hills, Calif., assignor to Measurex Corporation, Santa Clara, Calif.

Filed Jan. 17, 1969, Ser. No. 792,007
Int. Cl. G21h *5/00*
U.S. Cl. 250—83.3 D **13 Claims**

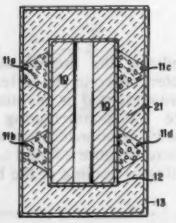


Sheet-gauging apparatus for gauging properties of sheet material and having upper and lower gauging heads with timing belt means for precisely moving the gauging heads with respect to the sheet material.

3,621,260
METHOD OF DETERMINING PROCESSABILITY OF TAR SANDS
Chester N. White, Delaware, and Philip D. Freedman, Philadelphia, both of Pa., assignors to Great Canadian Oil Sands Limited, Toronto, Canada
Filed July 9, 1968, Ser. No. 743,288
Int. Cl. G01v 5/00
U.S. Cl. 250—106 4 Claims

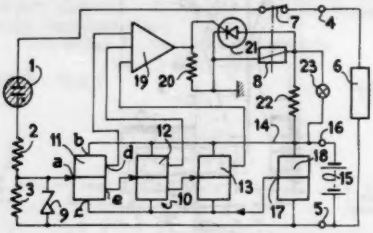
The specification discloses a method for selectively mining bituminous tar sands which comprises collecting samples of tar sands from an exploration zone, analyzing the samples for their content of aluminum, and correlating the sample locations with the analysis to determine the location having the lower content of aluminum and hence the more easily processable tar sand.

3,621,261
RADIOISOTOPE FUEL CAPSULE
Frank T. Princiotta, and Harold N. Barr, both of Baltimore, Md., assignors to The United States of America as represented by the United States Atomic Energy Commission
Filed Apr. 4, 1969, Ser. No. 813,489
Int. Cl. G21h 5/00
U.S. Cl. 250—106 S 9 Claims



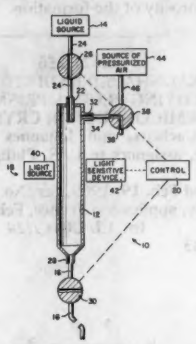
A radioisotope fuel capsule having a radioisotope heat source encapsulated by a bimodal thermal insulator comprising a porous insulating layer with a material of higher thermal conductivity and lower melting point than the porous insulating layer disposed in the insulating layer.

3,621,262
ALARM DEVICE GAS DISCHARGE TUBE
Daniel Lecuyer, Le Pecq, France, assignor to La Detection Electronique Francaise, Vanves, France
Filed Feb. 7, 1969, Ser. No. 797,402
Claims priority, application France, Feb. 15, 1968, 139945
Int. Cl. H01j 39/12
U.S. Cl. 250—214 9 Claims



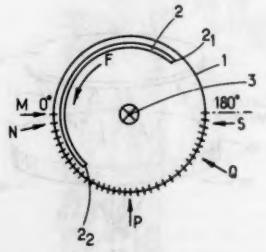
Alarm device for detecting a radiation in a given space. The device comprises a discharge tube responsive to said radiation, a pulse generator having a first frequency and connected to said tube, a counting device whose input is connected in the circuit of said tube and of said generator, a time-base circuit connected to the reset terminal of said counting device and furnishing reset pulses at a second frequence, a control device connected to said counting device, and a signal device controlled by said control device.

3,621,263
VOLUMETRIC FRACTION SUPPLY APPARATUS
Warren E. Gilson, 4801 Sheboyan Ave., and Robert E. Gilson, 4 Franklin Ave., both of Madison, Wis.
Filed Apr. 13, 1970, Ser. No. 27,847
Int. Cl. G01n 21/26
U.S. Cl. 250—218 7 Claims



A volumetric unit for supplying fractions of predetermined volume from a source of liquid to a fraction collector receptacle includes a container into which liquid is supplied through a supply conduit and a liquid supply valve. During the supply of liquid, a liquid delivery conduit extending from the container is blocked, and displaced air is vented from the container by a vent conduit including an air vent valve. When a predetermined volume of liquid has been admitted to the container, a liquid level sensing system operates a control to simultaneously close the liquid supply valve and to close the air vent valve. The container is pressurized to force the accumulated liquid fraction through the liquid supply conduit to the fraction collector receptacle.

3,621,264
METHOD AND APPARATUS FOR PROVIDING A CYCLIC SUPPLY OF SEQUENCES PROPORTIONAL TO A GIVEN FRACTION OF THE DURATION OF A WORKING CYCLE
Francis Bonneric, Fleury-les-Aubrais, France, assignor to Service D'Eploitation Industrielle des Tabacs et des Allumettes, Paris, France
Filed May 27, 1969, Ser. No. 811,124
Claims priority, application France, Mar. 29, 1968, 146,391
Int. Cl. G01n 21/30; G01d 5/36; H01j 5/02
U.S. Cl. 250—219 D 12 Claims



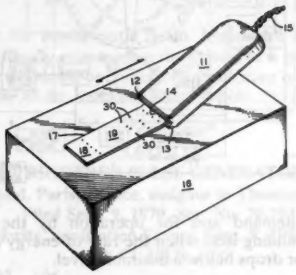
The invention relates to a programming process and device which provides a cyclic supply of sequences proportional to a given fractional part of the actual duration of a working cycle, particularly of a machine, such sequence being set by the signals produced by two sensitized units, both of which can be either in a sensitized state or in a nonsensitized state.

3,621,265

HAND HELD CODED DOCUMENT READER INTO WHICH DOCUMENT IS FIRST INSERTED AND THEN READ AS IT IS WITHDRAWN

Robert M. Berler, Westport, Conn., assignor to Pitney Bowes-Alpex, Inc., Danbury, Conn.

Filed July 29, 1969, Ser. No. 845,860
Int. Cl. G01n 21/30; G06k 7/00
U.S. Cl. 250—219 D 3 Claims



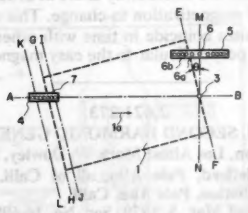
A device held in the hand for reading intelligence contained on a document in the form of coded punched holes. The device includes a slot to receive the document, a light source positioned on one side of the slot and aligned with the light source on the other side of the slot is a light detector means comprising one or more photocells. A suitably formed housing capable of substantially excluding light contains the document-receiving slot, the light source and photocell detector.

3,621,266

METHOD AND APPARATUS FOR MEASURING THE LENGTHS OF OBJECTS BEING CONVEYED

Tomohiko Akuta; Yoshio Honsyo, and Shinya Hashirizaki, all of Kitakyushu, Japan, assignors to Yawata Iron & Steel Co. Ltd., Tokyo, Japan

Filed Nov. 18, 1969, Ser. No. 877,767
Claims priority, application Japan, Nov. 18, 1968, 43/84335
Int. Cl. G01b 7/04
U.S. Cl. 250—219 4 Claims



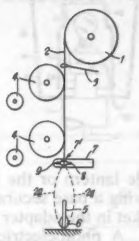
A method and an apparatus for carrying out the said method, by means of which an actual length of an object being conveyed can be accurately measured, even when the object is conveyed in an oblique state with such a continuous conveying equipment as a belt conveyor and the like.

3,621,267

METHOD AND APPARATUS FOR DETECTING A BREAK IN LONGITUDINALLY MOVING YARN

Geoffrey Alan Dent, Fence, near Burnley, England, assignor to Crabtree Engineering Group (Colne) Limited, Lancashire, England

Filed Dec. 1, 1969, Ser. No. 881,224
Claims priority, application Great Britain, Dec. 18, 1968, 60,081/68
Int. Cl. G01n 21/32
U.S. Cl. 250—219 S 5 Claims



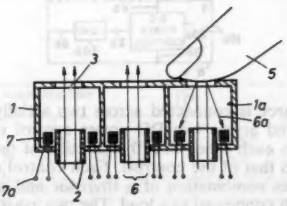
The disclosure of this specification relates to detecting yarns comprising displacing longitudinally moving yarn in a lateral direction to intermittently and repeatedly interrupt a light beam acting on a light sensitive device responsive to the intensity of light thereon, detecting the period for which the light beam is interrupted during lateral displacement of the yarn, emitting a signal in response to the detected period and utilizing the signal, or variations from a predetermined signal, to activate a yarn-handling device.

3,621,268

REFLECTION TYPE CONTACTLESS TOUCH SWITCH HAVING HOUSING WITH LIGHT ENTRANCE AND EXIT APERTURES OPPOSITE AND FACING

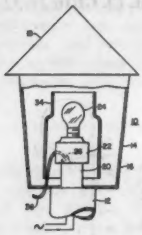
Kurt Friedrich, Neckarhausen, and Georg Straimer, Bad Godesberg, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 10, 1968, Ser. No. 782,547
Claims priority, application Germany, Dec. 19, 1967, P 15 66 695.2
Int. Cl. G01j 3/34, 3/50; G06m 7/00
U.S. Cl. 250—221 15 Claims



Contactless touch switch in which an electric pulse is produced by light impinging on a photosensitive cell due to reflection of a beam of light. According to the invention the touch switch is constructed in such a manner that the beam of light normally emerges through an aperture in the touch switch housing, which is closed on all sides, and that the photosensitive cell, which is protected by screening, can receive substantially only those rays which are produced by reflection of the beam of light at an object, preferably a finger covering said aperture.

3,621,269
PHOTOCONTROL APPARATUS PARTICULARLY FOR OUTDOOR POLE LANTERN
John J. Misencik, Pine Rock Park, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 31, 1969, Ser. No. 889,511
Int. Cl. G02b *5/14;* **H01j** *5/02*
U.S. Cl. 250—227 **4 Claims**

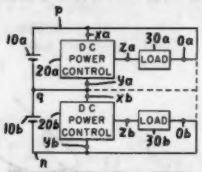


For an electrical pole lantern or the like, a photocontrol adapter is provided having a base securable into the original lamp socket with a socket in the adapter for receiving a lamp to be photocontrolled. A photoelectrically responsive element within the adapter has a fiber optic light guide connected in optical relationship with it and extending from the adapter to receive exterior ambient light and conduct it to the responsive element. The fiber optic light guide permits use of the adapter with a variety of pole lantern configurations including those with decorative glass shields laterally enclosing the lamp while retaining good appearance and avoiding having electrical leads in any position where they are subject to damage or present an electrical hazard.

ERRATUM

For Class 296—35 A see:
Patent No. 3,621,236

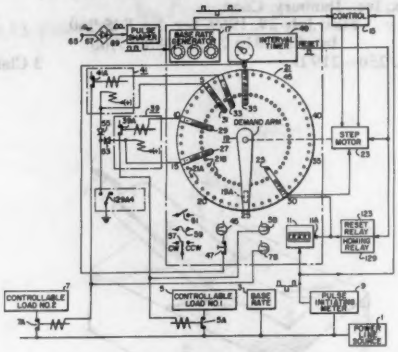
3,621,270
SYSTEM FOR CONTROLLING DC POWER
Masahiko Akamatsu, Hyogo Prefecture, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed July 7, 1969, Ser. No. 839,509
Claims priority, application Japan, July 8, 1968, 43/47649
Int. Cl. H02j *1/10*
U.S. Cl. 307—24 **3 Claims**



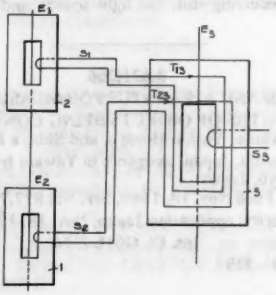
A DC source is connected across two serially connected capacitors and across two DC power control units serially connected to each other with the junction of the capacitors connected to that of the controls. Each control unit may include a series combination of a thyristor and a diode with their junction connected to a load. The two loads can be connected together to the junction of the control units or respectively to both sides of the DC source.

3,621,271
LOAD REGULATION APPARATUS
Carl J. Snyder, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 9, 1970, Ser. No. 1,588
Int. Cl. H02j *3/14*
U.S. Cl. 307—38 **6 Claims**

A demand arm is located relative to a dial by means of a step motor in accordance with the difference between the rate at which electric energy is consumed during a demand interval and a base rate of energy consumption which should not be exceeded. Electric switches are distributed along the path of the demand arm for operation by the arm for shedding and adding load when the rate of energy consumption exceeds or drops below a desirable level.



3,621,272
VARIABLE-THRESHOLD MAGNETIC CIRCUIT ELEMENT
Michel Carbonel, Paris, France, assignor to Thomson- CSF
Filed July 16, 1969, Ser. No. 842,102
Claims priority, application France, July 25, 1968, 160,539
Int. Cl. H03k *19/168;* **G11c** *11/14*
U.S. Cl. 307—88 LC **4 Claims**

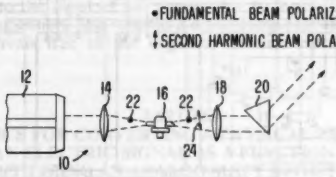


A magnetic element having an easy magnetic axis is subjected to current pulses producing a field directed along this axis. These pulses are sufficiently short in order not to cause the direction of magnetization to change. This will take place only if these pulses coincide in time with other pulses which produce a field perpendicular to the easy magnetic axis.

3,621,273
OPTICAL SECOND HARMONIC GENERATOR
Robert J. Rorden, Los Altos; Mark W. Dowley, Palo Alto, and Wayne S. Mefferd, Palo Alto, all of Calif., assignors to Coherent Radiation, Palo Alto, Calif.
Filed Mar. 5, 1970, Ser. No. 16,698
Int. Cl. H02m *5/02*
U.S. Cl. 307—88.3 **19 Claims**

A device for providing an optical second harmonic output beam of coherent radiation such as light in response to an input beam of coherent radiation at the fundamental wavelength. A nonlinear crystal is provided within a vacuum sealed enclosure. The input light beam is provided through a first window forming an integral part of the enclosure and which is maintained at Brewster's angle to the incoming

beam. A second window orthogonally oriented relative to the first window is provided for maximizing the resulting second harmonic wavelength output beam which is polarized 90° relative to the fundamental beam. Means are also provided for automatically maintaining the crystal at a predetermined temperature. During operation, the enclosure is evacuated of substantially all air, including water vapor.

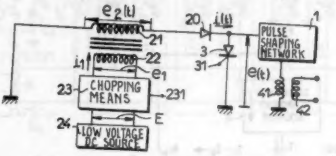


3,621,274

TRIGGERED PULSE GENERATOR

Gabriel Plond, Paris, France, assignor to Thomson-CSF

Filed Sept. 9, 1970, Ser. No. 70,793
Claims priority, application France, Sept. 9, 1969, 69/30547
Int. Cl. H03k *3/00*
U.S. Cl. 307—106 **7 Claims**



A triggered pulse generator comprising a load inductor, controlled discharging means and pulse shaping means; the load inductor builds up the secondary winding of a transformer whose primary winding is fed with a sawtooth voltage synchronized with the discharging means control.

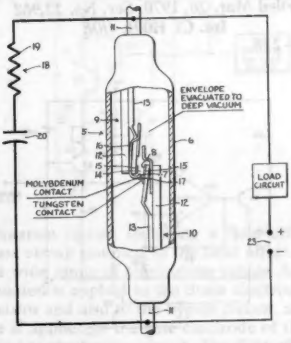
The voltage of the triggered pulse may be controlled through controlling the duration of the teeth of the sawtooth voltage.

3,621,275

LONG LIVED SWITCH MEANS FOR INDUCTIVE DC CIRCUITS

John D. Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation-in-part of application Ser. No. 795,883, Feb. 3, 1969, now abandoned. This application Dec. 3, 1970, Ser. No. 94,9773
Int. Cl. H01h *9/00*
U.S. Cl. 307—137 **5 Claims**



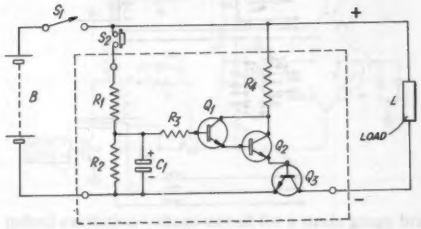
A switch having unlike metal contacts in a deep vacuum environment has its higher melting point contact connected to be negative at switch opening. In shunt across the switch contacts are a resistor and a capacitor, in series; or a resistor alone can be shunted across the load. In either case the resistor is of about 500 to 5,000 ohms. The capacitor is of a value to afford to the shunt circuit a time constant of not less than about one microsecond.

3,621,276

ELECTRIC TIMING CIRCUITS

Cyril John Mitchell, 5 Weycrofts, Bracknell, England

Filed July 30, 1970, Ser. No. 59,470
Claims priority, application Great Britain, Aug. 2, 1969, 38,829/69
Int. Cl. H02h *7/20*
U.S. Cl. 307—141 **1 Claim**



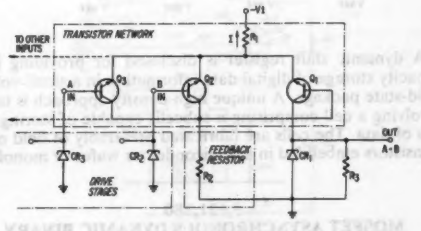
An electric timing circuit to prevent the battery of a test instrument from being discharged if the instrument is left switched on when not in use. An amplifier and a capacitive element connected across the input circuit of the amplifier so that when the battery is connected across the capacitive element, the capacitive element charges up to effect closure of a current path through the circuit, and when the battery is disconnected from across the capacitive element, the capacitive element discharges thereby breaking the current path through the circuit after an interval determined by the rate of fall of the voltage across the capacitive element.

3,621,277

FAST RESPONSE LOW-POWER-DRAIN LOGIC CIRCUITS

Ciro A. Cancro, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,423
Int. Cl. H03k *19/08*
U.S. Cl. 307—206 **10 Claims**



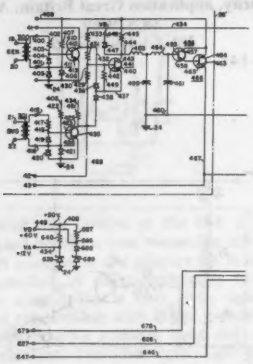
This disclosure describes switching circuits, useful as basic logic circuits, that comprise tunnel diodes in combination with transistors. The use of tunnel diodes, constant-current switching and series feedback between transistors, results in switching circuits with very fast response times and low-power drains.

3,621,278

AUTOMATIC GENERATOR SYNCHRONIZING AND CONNECTING SYSTEM AND SYNCHRONIZER APPARATUS FOR USE THEREIN

Tibor Rubner, Pittsburgh; Andre Wavre, Monroeville, and John H. Bednarek, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 695,684, Jan. 4, 1968
Filed Dec. 23, 1969, Ser. No. 889,825
Int. Cl. H03k *19/32*
U.S. Cl. 307—216 **1 Claim**



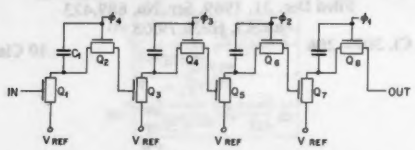
Two alternating current voltages are applied to transistor circuits and converted to square waves of constant amplitude which are applied to an additional transistor circuit which produces a positive output voltage only when both of said square waves are positive or when both of the square waves are at ground, but not while one square wave is positive and the other square wave is at ground, and circuit means for utilizing the output of the additional transistor circuit is provided.

3,621,279

HIGH-DENSITY DYNAMIC SHIFT REGISTER

Teh-Sen Jen, Fishkill; Wilbur D. Pricer, Poughkeepsie, N.Y., and Norbert G. Vogl, Jr., Essex, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1970, Ser. No. 6,498
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 C **6 Claims**



A dynamic shift register is disclosed for providing large capacity storage of digital data information in a small-volume solid-state package. A unique high-density approach is taken, involving a cell comprising n subcells capable of storing $n-1$ bits of data. The cells are fabricated preferably of field effect transistors embedded in a semiconductor wafer or monolith.

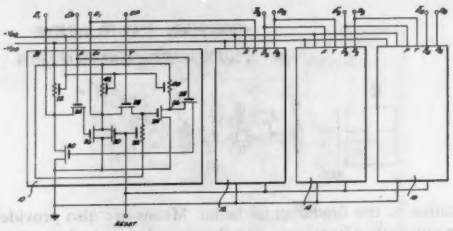
3,621,280

MOSFET ASYNCHRONOUS DYNAMIC BINARY COUNTER

Stephen P. F. Ma, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 10, 1970, Ser. No. 27,273
Int. Cl. H03k *3/26*
U.S. Cl. 307—225 **3 Claims**

A dynamic binary counter which operates in an asynchronous manner and which can be constructed on a single semiconductor substrate with metal oxide semiconductor field effect transistor (MOSFET) techniques. The counter stages are constructed from three MOSFET inverters and associated gating MOSFET's to take advantage of the capacitance characteristics of the gates of the MOSFET transistors.

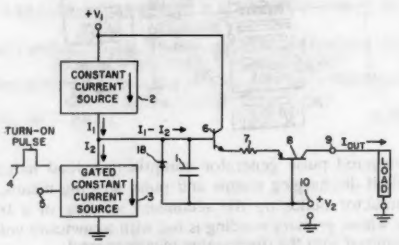


3,621,281

LINEAR RISE AND FALL TIME CURRENT GENERATOR

Thomas E. Hagen, Saugerties, N.Y., assignor to Ferroxcube Corporation of America, Saugerties, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,521
Int. Cl. H03k *3/00, 4/06*
U.S. Cl. 307—228 **4 Claims**



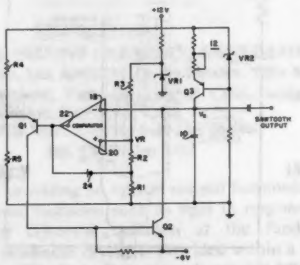
A current source having a linear rise and fall time which uses a pair of oppositely polarized constant current sources connected to a capacitor to control an emitter follower and a common base amplifier. Alternately activating and deactivating one of the constant current sources produces a linear rise and fall in the charge on the capacitor, which is reflected in a linear rise and fall in the output current of the common base amplifier.

3,621,282

SAWTOOTH GENERATOR WITH A RAMP-BIAS VOLTAGE COMPARATOR

Charles H. Haas, Edgewater, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 26, 1970, Ser. No. 22,962
Int. Cl. H03k *4/08*
U.S. Cl. 307—228 **1 Claim**



In a sawtooth generator the voltage ramp across a condenser is compared with a bias voltage source. The ramp and

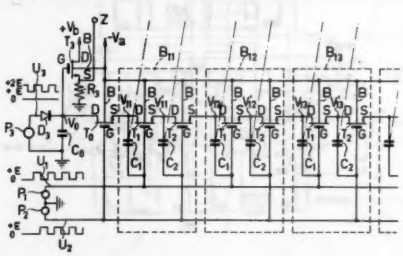
bias voltages are applied, respectively, to the two input terminals of a bistable comparator. When the two voltages are equal the comparator output voltage changes state suddenly to operate a first switch to discharge the condenser, and second switch to close a positive feedback circuit from the output to the input of the comparator to insure the reliable switching action. The result is a linear ramp repeated at regular intervals free of the vagaries of noise voltages in the system.

3,621,283

DEVICE FOR CONVERTING A PHYSICAL PATTERN INTO AN ELECTRIC SIGNAL AS A FUNCTION OF TIME UTILIZING AN ANALOG SHIFT REGISTER

Kees Teer, and Frederik Leonard Johan Sangster, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1969, Ser. No. 816,954
Claims priority, application Netherlands, Apr. 23, 1968, 6805706
Int. Cl. G06g *7/12*
U.S. Cl. 307—229 **4 Claims**



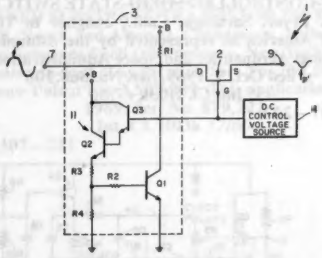
A device for converting energy patterns in the form of pressure, heat or magnetic images into an electrical signal as a function of time where the necessity for a scanning beam or a crossed bar readout system is eliminated by cascading elements which function as both storage and energy sensitive devices and by providing circuitry for shifting the charges of the energy sensitive storage elements in a single direction along the cascaded array.

3,621,284

ATTENUATION CIRCUIT

Ronald D. Cluett, Gloucester, and Vincent E. Larka, Burlington, both of Mass., assignors to Sylvania Electric Products, Inc.

Filed Dec. 7, 1970, Ser. No. 95,656
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **12 Claims**



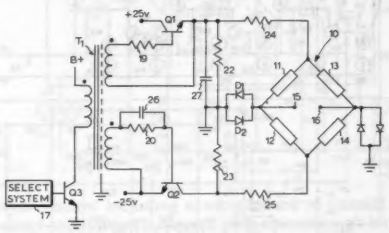
An attenuation circuit including a field effect transistor and a bypass circuit coupled to the field effect transistor for providing a wide range of attenuation values. An input signal to be attenuated is applied to the drain electrode of the field effect transistor and also to the bypass circuit, and a DC control voltage is applied to the gate electrode of the field effect transistor and to the bypass circuit. The field effect transistor and the bypass circuit each operate to cause attenuation of the input signal by a predetermined amount. As a result, the input signal applied to the drain electrode of the field effect transistor and to the bypass circuit is attenuated by a total amount related to the combined values of attenuation provided by the field effect transistor and the bypass circuit and applied via the source electrode of the field effect transistor to an output terminal.

3,621,285

PULSED EXCITATION VOLTAGE CIRCUIT FOR TRANSDUCERS

Karl F. Anderson, and Thomas L. Lynch, both of Lancaster, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 30, 1969, Ser. No. 872,602
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **10 Claims**



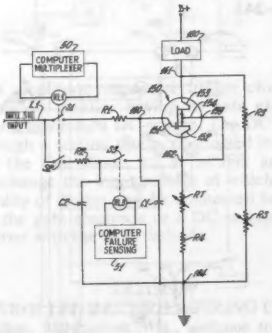
A pulsed excitation voltage circuit for a strain gauge bridge is disclosed using a transformer having its primary winding adapted to receive an excitation timing pulse and two secondary windings to turn on two transistor switches adapted to connect positive and negative voltage sources of equal amplitude to opposite ends of the bridge. Voltage limiting diodes are connected to output terminals to limit common-mode voltage spikes resulting from different turn-on and turnoff times of the transistor switches. Each transistor switch includes a base resistor selected at time of assembly to provide substantially equal turn-on times. A speedup capacitor may be used to further equalize turn-on time, and a shunt capacitor may be used at the output of one switch to offset effects of unequal turn-on times.

3,621,286

MEMORY UNIT PROVIDING OUTPUT OVER LONGER TIME PERIODS THAN DURATION OF INDIVIDUAL INPUT SIGNALS

Eugene C. Varrasso, 1853 Cedar Circle, Heath, Ohio

Filed Mar. 9, 1970, Ser. No. 17,677
Int. Cl. G11c *11/34*
U.S. Cl. 307—238 **15 Claims**



Control apparatus which includes a memory unit having input means for receiving successive input signals and output means for providing an output signal over periods of time longer than the duration of individual input signals and which is functionally related to the last-received input signal; and

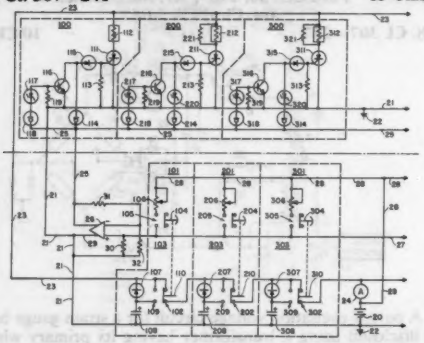
storage means for receiving, averaging, and storing the successive input signals. Means are provided for connecting the averaging or storage means to apply the averaged signal stored therein to the input means in response to an interruption in the reception of the successive input signals by the input means of the memory unit.

3,621,287

SOLID-STATE REMOTE CIRCUIT SELECTOR SWITCH

Victor S. Peterson, Sandusky, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 30, 1970, Ser. No. 76,899
Int. Cl. H03k *17/00*
U.S. Cl. 307—241 **13 Claims**



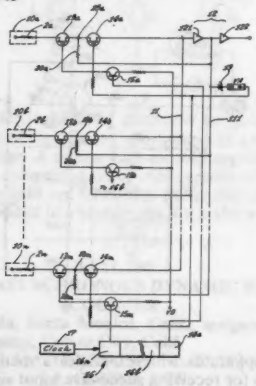
A plurality of controlled rectifiers each associated with a respective load to be energized are provided. Gate circuitry is provided for each controlled rectifier such that each controlled rectifier is sensitive to a control voltage that falls within certain limits. The limits are chosen to provide nonoverlapping ranges for the controlled rectifiers. Local selector circuits each include a bias voltage source whose output falls within respective ones of the nonoverlapping ranges of the gate circuits of the controlled rectifiers. Switch means are provided whereby the voltage of the bias sources may be selectively applied to the gate circuits of the controlled rectifiers.

3,621,288

MULTICHANNEL SWITCHING SYSTEM WITH UNITY-GAIN ISOLATION AMPLIFIER OPERATIVELY CONNECTED BETWEEN THE SELECTED CHANNEL AND REMAINING OPEN CHANNELS

Stewart C. Brown, Woodland Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 11, 1969, Ser. No. 856,992
Int. Cl. H03k *17/16, 17/56*
U.S. Cl. 307—243 **6 Claims**



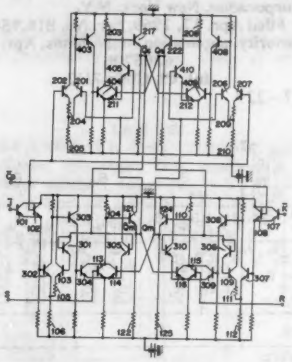
A multiplexer for low-level signals is disclosed wherein each channel has two FETs in series. A unity gain signal from an isolation amplifier for the current signal is fed through a resistor to junctions of FETs in each channel. The turnoff bias for the FETs varies in synchronism with that signal.

3,621,289

MASTER-SLAVE TYPE J-K FLIP-FLOP CIRCUITS COMPRISED BY CURRENT SWITCHING TYPE LOGICAL CIRCUITS

Sadao Sasaki, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi, Japan

Filed Dec. 6, 1968, Ser. No. 796,630
Claims priority, application Japan, Dec. 12, 1967, 42/79248
Int. Cl. H03k *17/00, 3/26*
U.S. Cl. 307—247 **8 Claims**



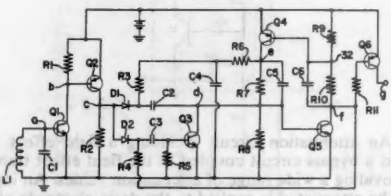
A master-slave type J-K flip-flop circuit comprising a master flip-flop circuit-producing outputs Qm, Qm and a slave flip-flop circuit-producing outputs Qs, Qs. The master flip-flop The master flip-flop circuit includes a first set input circuit having a current-switching type logical circuit which performs an AND operation of an input J and clock Cp in reference to the output Qs and a first reset input circuit having a current-switching type logical circuit which performs and AND operation of an input K and clock Cp in reference to the output Qs. The slave flip-flop circuit includes a second set input circuit having a current-switching type logical circuit which executes a current-switching operation of the clock Cp in reference to the output Qm and a second reset input circuit having a current-switching type logical circuit which executes a current-switching operation of the clock Cp in reference to the output Qm.

3,621,290

RF-CONTROLLED SOLID-STATE SWITCH

Thomas B. Fryer, Saratoga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 9, 1969, Ser. No. 865,106
Int. Cl. H03k *17/60*
U.S. Cl. 307—247 **6 Claims**



An electronic element, capable of presenting either a high impedance or a low impedance between a power source and an instrument, is switched from its high impedance to its low

impedance state by turning on both active elements of a complementary bistable multivibrator. By momentarily short-circuiting one of the two active elements of the complementary bistable multivibrator, thereby driving its two active elements from the on to the off state, the electronic element is switched back from its low impedance to its high impedance state. When off, this circuit consumes essentially zero standby power.

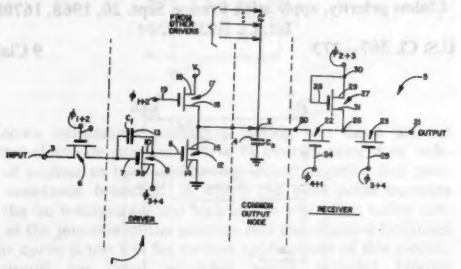
Alternative-switching circuits use symmetrical bistable multivibrators, activated by amplified and rectified transmitted pulses, to switch a gating element from its high impedance to its low impedance state, and vice versa.

3,621,291

NODABLE FIELD-EFFECT TRANSISTOR DRIVER AND RECEIVER CIRCUIT

Ted Y. Fujimoto, Santa Ana, Calif., assignor to North American Rockwell Corporation

Filed Sept. 8, 1970, Ser. No. 70,352
Int. Cl. H03k *17/00*
U.S. Cl. 307—251 **5 Claims**



A field-effect transistor driver circuit using a feedback capacitor at the output stage unconditionally charges an output node at least during a first phase recurring clock signal and the input to the driver is evaluated during a second phase recurring clock signal so that the output is conditionally discharged as a function of the input. One or more drivers may be connected at a common output node for implementing a logic function.

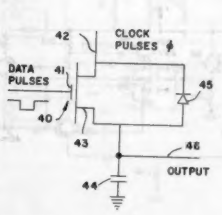
A receiver pre-output node is precharged during the driver output precharge phase and the receiver output is precharged unconditionally during the driver evaluation phase. The common output node for the driver circuit is evaluated as an input to the receiver so that the receiver output is conditionally discharged as a function of the voltage at the common output node. After the receiver output has been evaluated, it is isolated until the next clock cycle.

3,621,292

PULSED SUBSTRATE TRANSISTOR INVERTER

Charles B. Vogel, and Alton O. Christensen, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Continuation-in-part of application Ser. No. 782,561, Dec. 10, 1968, now Patent No. 3,502,909. This application Nov. 24, 1969, Ser. No. 879,222
Int. Cl. H03k *17/60*
U.S. Cl. 307—251 **5 Claims**



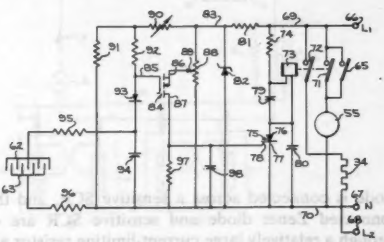
An inverter circuit for field-effect transistors consisting of at least one transistor with a capacitor connected between the source electrode and ground, a diode connected between the drain and source electrodes and a source of negative clock pulses tied to the drain electrode and substrate electrode.

3,621,293

ELECTRONIC DRYER CONTROL

Donald S. Heidtmann, Louisville, Ky., assignor to General Electric Company

Filed Mar. 9, 1970, Ser. No. 17,535
Int. Cl. H03k *17/64*; **F26b** *13/10*
U.S. Cl. 307—252 N **12 Claims**



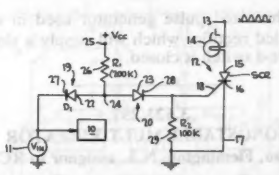
A dryer control including sensing means to contact items being dried to establish a current path therethrough having a resistance which is a function of the moisture content of the items bridging the sensing means; switch means to terminate operation of the dryer; and circuit means, including a capacitor, interconnecting the sensing means and the switch means. The circuit means include an insulated gate field-effect transistor. The transistor operates the switch means to terminate operation of the dryer when the charge on the capacitor reaches a predetermined level.

3,621,294

SCR LAMP DRIVER

Rodger A. Cliff, College Park, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 26, 1968, Ser. No. 779,025
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 N **7 Claims**



A voltage amplitude-responsive trigger circuit includes a silicon-controlled rectifier having its gate electrode biased through a first diode by a DC source. The DC source applies current through a second diode, connected in opposed relationship to the first diode, to a variable amplitude-signal source. To change the input voltage at which the SCR triggers, a plurality of diodes may be connected between the DC source and the gate electrode or a DC voltage may be connected in series with the SCR cathode.

3,621,295

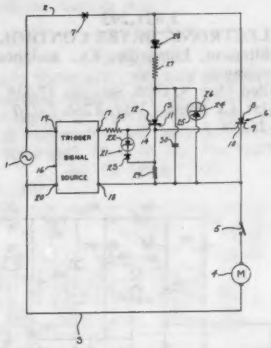
CONTROLLED RECTIFIER-FIRING CIRCUIT

John E. Callan, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed July 7, 1969, Ser. No. 839,517
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 W **6 Claims**

A control circuit for a DC motor has a power SCR connected between the DC motor and AC source. A sensitive

SCR is connected across the power SCR and the gate of the power SCR to fire it. The sensitive SCR is triggered by a conventional trigger signal source. A voltage-limiting Zener



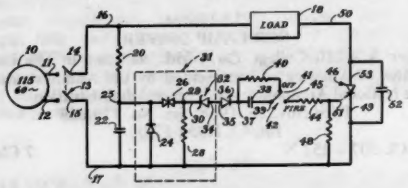
diode is connected across a sensitive SCR, and the parallel connected Zener diode and sensitive SCR are connected through a relatively large current-limiting resistor and a rectifier diode to the AC source.

3,621,296

POWER PULSE CIRCUIT

Martin Berger, 4321 Miller Road, Scottsdale, Ariz.

Filed Oct. 13, 1969, Ser. No. 865,768
Int. Cl. H03k *4/80, 17/72*
U.S. Cl. 307—252 N **3 Claims**



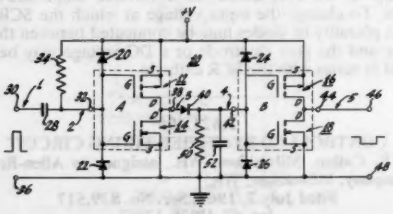
A line-synchronized pulse generator used in conjunction with a controlled rectifier which will supply a single current pulse each time a switch is closed.

3,621,297

MONOSTABLE MULTIVIBRATOR

Jack Allen Dean, Flemington, N.J., assignor to RCA Corporation

Filed Sept. 24, 1969, Ser. No. 860,591
Int. Cl. H03k *1/18*
U.S. Cl. 307—265 **8 Claims**



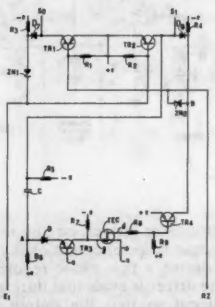
A monostable multivibrator circuit is disclosed which provides a relatively constant width pulse despite large variations from circuit to circuit in the switching transfer voltage characteristics of two switching devices used in any one circuit; in any one circuit, each of the two switching devices have the same switching transfer voltage characteristic. The two switching devices are connected in such a manner that the first device is turned on for a time determined by a first time-constant circuit, and the second device is turned on while the first device is on plus a time determined by a second time-constant circuit. In this manner, the effect on the width of the output pulse by the transfer voltages of one device is cancelled out by the effect on the width of the transfer voltage of the other device. Thus a relatively constant width pulse always results.

3,621,298

MONOSTABLE DEVICE HAVING A HIGH TIME CONSTANT WITH SHORTENED REUSE TIME

Claude Rousseau, Joinville-le-Pont, France, assignor to C.I.T.-Compagnie Industrielle Des Telecommunications, Paris, France

Filed Sept. 22, 1969, Ser. No. 859,711
Claims priority, application France, Sept. 20, 1968, 167087
Int. Cl. H03k *3/284*
U.S. Cl. 307—273 **9 Claims**



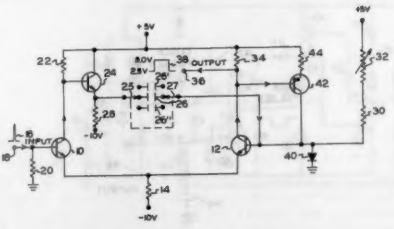
The device comprises, on the one hand, a bistable device transistors which forms a bistable flip-flop, and, on the other hand, a device consisting of a capacitor and high time-constant transistors, the latter device comprising a field-effect transistor capable of introducing itself, on a first order, into one of the bridges of the bistable device to destroy the latter's symmetry, the bistable state thus created being liable to come to an end before exhaustion of the time-constant on a second order transmitted to the bistable device.

3,621,299

MONOSTABLE MULTIVIBRATOR HAVING WIDE TIMING RANGE

Ronald C. Barber, Portland, Oreg., assignor to Tektronix Inc, Beaverton, Oreg.

Filed Sept. 22, 1969, Ser. No. 859,844
Int. Cl. H03k *3/284*
U.S. Cl. 307—273 **10 Claims**



A monostable multivibrator is described in which a gate transistor is added to supply bias current to the base of an

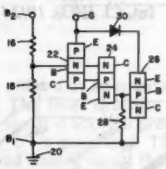
output transistor through a current path different from that through which the timing current flows. The gate transistor is of an opposite conductivity type than the output transistor and is switched off by such output transistor when the multivibrator is triggered. This monostable multivibrator has a much wider range of timing current adjustment which is greater than one thousand to one.

3,621,300

TRANSISTOR CIRCUIT HAVING THE PROPERTIES OF A UNIJUNCTION TRANSISTOR IN IMPROVED DEGREE

Lowell E. Clark, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 10, 1969, Ser. No. 856,658
Int. Cl. H03k *3/26*
U.S. Cl. 307—283 **8 Claims**



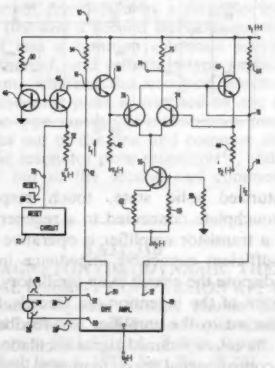
Known unijunction transistors having two bases and an emitter electrode provide a curve of emitter current vs. voltage of emitter to base one having joined negative and positive resistance branches, in which the peak-point currents and the on voltages are too high and in which the valley current at the junction of the positive and the negative branches of the curve is too low for certain applications of this circuit. A circuit has been provided which includes bipolar transistors and resistors or which includes a bipolar transistor and a four layer transistor, which can be put on a chip by known methods, that provides a wider and more controllable range for these parameters than is provided by known unijunction transistors or known bipolar transistor equivalents thereof.

3,621,301

THRESHOLD-RESPONSIVE REGENERATIVE LATCHING CIRCUIT

James J. Tomczak, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,383
Int. Cl. H03k *3/15, 3/26*
U.S. Cl. 307—290 **4 Claims**



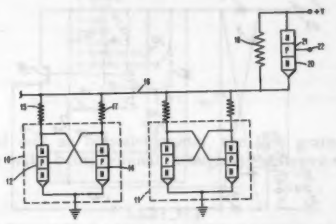
A monolithic transistorized latching circuit which switches from its normal reset state to a set state in response to a predetermined change in a differential input current. The latching circuit is normally biased to its reset state by means of a threshold-biasing circuit electrically independent of the different current. This arrangement permits the latching circuit to reject common mode nose currents which may be contained in the differential input current.

3,621,302

MONOLITHIC-INTEGRATED SEMICONDUCTOR ARRAY HAVING REDUCED POWER CONSUMPTION

Wilbur David Pricer, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,477
Int. Cl. H03k *3/286*
U.S. Cl. 307—291 **5 Claims**



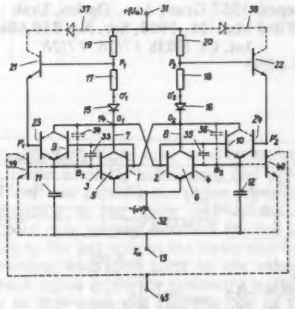
A single power source is connected to a plurality of parallel-connected storage cells, which are in one of two bistable states, to provide a common constant-current source when the cells are in a standby storage condition and to apply a constant voltage source to increase the power level when the cells are in an active condition.

3,621,303

BISTABLE MULTIVIBRATOR CIRCUIT

Claude Roger Fonjallaz, Cormondreche, Switzerland, assignor to Centre Electronique Horloger S.A., Brequet-Neuchatel, Switzerland

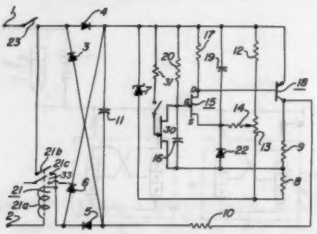
Filed Nov. 3, 1969, Ser. No. 873,441
Claims priority, application Switzerland, Nov. 7, 1968, 16.596/68
Int. Cl. H03k *3/286*
U.S. Cl. 307—292 **7 Claims**



A bistable multivibrator including two symmetrically arranged pairs of transistors in which, in each pair, the emitters and the collectors of a first and of a second transistor respectively are connected together to form common emitter and collector circuits, the base of the first transistor of each pair being connected to the collector circuit of the other pair. First and second supplementary transistors are provided, each having its collector connected to the common collector circuit of a corresponding transistor pair, its base to the base of the first transistor for each of said corresponding transistor pair and its emitter to the base of the second transistor of said corresponding transistor pair. Further, first and second

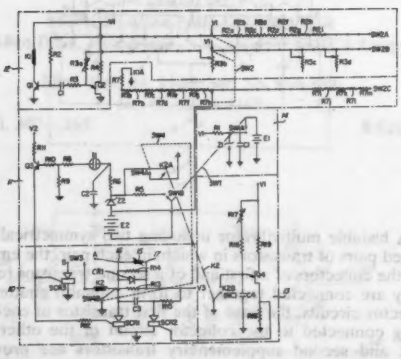
pairs of bias diodes are coupled between the base of the second transistor and common collector circuit of the first and second pairs respectively of the symmetrically arranged transistor pairs.

3,621,304
RAPID RESET TIMING CIRCUIT EMPLOYING CURRENT SUPPLY DECOUPLING
Grover K. Houpt, Wayne, Pa., assignor to Automatic Timing & Controls, Inc., King of Prussia, Pa.
Filed Jan. 15, 1969, Ser. No. 791,326
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **15 Claims**



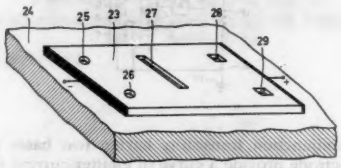
The timing circuit is adapted to be connected to a DC power supply and has four branches. One branch is coupled to the supply and includes a capacitor which begins to charge up at the beginning of the timing interval when connected to the power supply. A second branch is in parallel with the first branch and includes a field effect transistor in circuit with a first resistor. The FET is coupled to the capacitor and is adapted to be turned on when it has a predetermined charge. The third branch is in parallel with said first branch and includes a second resistor and a potentiometer which is coupled to the switching means to control the voltage, and hence the time, at which the FET is rendered conductive. A fourth branch is in parallel with the first branch and includes a second transistor connected to the first transistor and adapted to be rendered conductive in response to conduction through said first transistor and to drive an appropriate output circuit such as a relay coil.

3,621,305
SOLID-STATE, ELECTRONIC TIMER
George H. Jones, 3557 Grant Ave., Ogden, Utah
Filed Mar. 26, 1969, Ser. No. 810,686
Int. Cl. H03k *17/26, 17/28*
U.S. Cl. 307—293 **19 Claims**



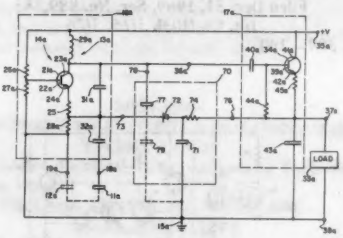
A portable, solid-state on-off sequence, electronic timer particularly useful for but not limited to the control of motion picture cameras. This timer includes a time-delay circuit interconnected with a multivibrator circuit for providing time-delay control, a control circuit for the camera or other device being controlled, and an oscillator circuit for timing duration of operation of each camera or other device. This combination provides much greater flexibility of control than has heretofore been available in equipment of comparable size and cost. The multivibrator and oscillator circuits are conventional in and of themselves, only minor modifications being required to make them function properly in the timer of the invention.

3,621,306
CONTROLLED GUNN EFFECT DEVICE
Gerhard Schickle, Backnang Wurttemberg, Germany, assignor to Telefunken Patentverwertungsgesellschaft GmbH, Ulm am Danube, Germany
Filed Sept. 23, 1968, Ser. No. 761,684
Claims priority, application Germany, Sept. 29, 1967, P 15 91 725.6
Int. Cl. H03k *19/24*
U.S. Cl. 307—299 **2 Claims**



A Gunn-effect device in which the active layer of the semiconductor body is provided with a suitable recess, hole or opening which extends through the active layer and which directly or indirectly affects the high electric field zone in the crystal.

3,621,307
TOUCH RESPONSIVE CONTROL CIRCUIT
Richard C. Raven, and Leonard M. Moser, both of Reno, Nev., assignors to Raven Electronics Corporation
Continuation-in-part of Ser. No. 747,324, July 24, 1968, abandoned
U.S. Cl. 307—308 **11 Claims**

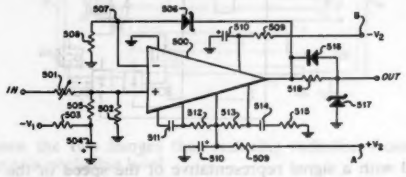


A miniaturized solid state, touch responsive circuit wherein a touchplate connected to a regenerative feedback network of a transistor amplifier is operative when touched to supply sufficient capacitive impedance in the feedback network to dispose the circuit in an oscillatory condition. In a preferred form of the invention, an electrical detection circuit is connected to the amplifier and feedback network to respond to the touch induced signal oscillations and provide a rectified control signal for actuating a load switch or the like. Also a hold circuit is provided for sustaining the oscillatory condition of the amplifier circuit automatically after being momentarily actuated by touch, and wherein a second touch plate is provided for terminating this sustained condition again in response to touch.

3,621,308
LEVEL DETECTOR

George J. Dusheck, Jr., Cinnaminson, N.J., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 3, 1969, Ser. No. 788,861
Int. Cl. H03k 3/26
U.S. Cl. 307—318 5 Claims

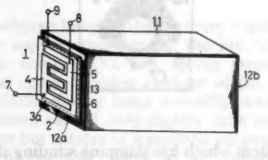


A level detector is utilized as an interface between analog and digital circuitry. The level detector generates a digital "1" when the analog signal is above a predetermined level at other times a digital "0" is generated. This is accomplished by feeding the received analog signal through a variable resistor network to the noninverting input of an operational amplifier with a zener diode in the feedback network.

3,621,309
ELECTRIC-MECHANICAL TRANSDUCER

Takeo Yokoyama, and Kitamura Atsugi, both of Hiroshi, Kanagawa, Japan, assignors to Mitsumi Electric Company Ltd., Tokyo, Japan

Filed Apr. 13, 1970, Ser. No. 27,738
Claims priority, application Japan, Apr. 19, 1969, 44/30070
Int. Cl. H01v 7/00
U.S. Cl. 310—8.7 2 Claims



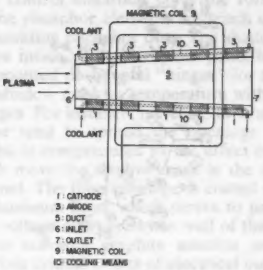
An electric-mechanical transducer having corrugated or comblike characteristics comprising an electric-mechanical transducer element constituted by a piezoelectric resonator plate having a first and a second electrode provided on one surface thereof and a common electrode provided on the other surface thereof, and reflection-type supersonic transmission medium, wherein the common electrode of the piezoelectric resonator plate is attached to one end surface of the reflection-type supersonic transmission medium, input terminals are let out of the first and common electrodes of the piezoelectric resonator plate respectively, and output terminals are led out of the second and common terminals thereof.

3,621,310
DUCT FOR MAGNETOHYDRODYNAMIC THERMAL TO ELECTRICAL ENERGY CONVERSION APPARATUS

Hisasuke Takeuchi; Ryoichi Sasaki; Humio Hataya; Ryo Hiraga; Eiichi Ishibashi, and Takao Koyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 1, 1970, Ser. No. 42,291
Claims priority, application Japan, May 30, 1969, May 31, 1969, 44/42631; 44/42710
U.S. Cl. 310—11 12 Claims

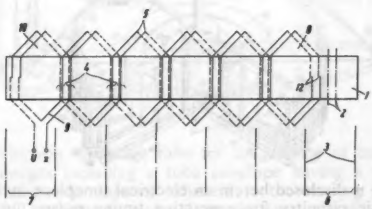
A duct for magnetohydrodynamic thermal-to-electrical energy conversion apparatus, which is provided with at least a pair of anode electrodes and cathode electrodes, the cathode possessing excellent erosion or corrosion resistance characteristics being made of an alloy consisting of a refractory metal and an adhesive metal, the fine grains of the refractory metal being bonded through the adhesive metal.



3,621,311
MULTIPHASE DOUBLE-LAYER WINDING FOR ELECTROMAGNETIC PUMPS AND CONVEYOR TROUGHS

Axel Von Starck, Remscheid-Luttringhausen, Germany, assignor to AEG Elotherm GmbH, Remscheid-Hasten, Germany

Filed Feb. 13, 1970, Ser. No. 11,198
Claims priority, application Germany, Feb. 20, 1969, Dec. 9, 1969; P 19 08 457.2, P 19 61 660.5
Int. Cl. H02k 3/04
U.S. Cl. 310—13 4 Claims



A multiphase two-layer bar wave winding having a winding head in one plane whereby half-wound end poles are provided and at least one winding per phase occupying one slot per pole beginning at the same end of the stator and progressing from pole to pole between the top and bottom layer returning to the last pole at the stator end by forming a loop and changing from one layer to the other and then proceeding back again in mirror symmetry to the beginning of the stator so that each slot has one bar of the forward going and one bar of the returning portion of the winding.

3,621,312
SIMULATED TWELVE-POLE STEPPING MOTOR HAVING EIGHT ACTUAL POLES

Albert Palmero, Wallingford, Conn., assignor to The Superior Electric Company, Bristol, Conn.

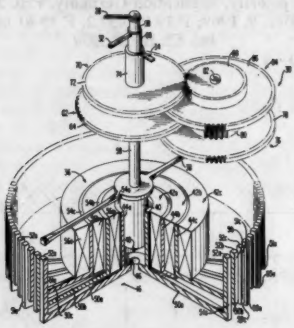
Filed Sept. 22, 1970, Ser. No. 74,416
Int. Cl. H02k 37/00
U.S. Cl. 310—49 R 9 Claims

A stepping motor having a minimum of eight stator poles formed with teeth and a rotor having teeth with the effective pitches of the teeth being different to provide a three-tooth differential between the teeth. Each stator pole has a wind-

ing, and the windings are connected into two distinct phases and energized according to a four-step sequence to simulate

a twelve-pole motor to cause the rotor to move one-fourth of a rotor tooth pitch for each step of the sequence.

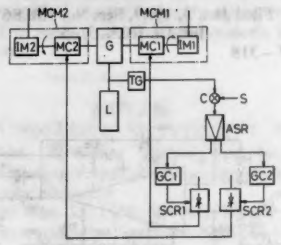
3,621,313
ELECTRONIC TIMEPIECE CONSTRUCTION EMPLOYING A FLAT STEP-BY-STEP ELECTROMECHANICAL ENERGY CONVERTER
Richard S. Walton, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.
Division of Ser. No. 726,090, May 2, 1968, Pat. No. 3,538,703
Filed Oct. 24, 1969, Ser. No. 871,080
Int. Cl. H02k *37/00*
U.S. Cl. 310—49 11 Claims



There is disclosed herein an electrical timepiece including electronic circuitry for generating timing pulses, an electromechanical energy converter driven in stepwise fashion by the timing pulses and a mechanical movement having a second hand driven directly by the energy converter and gear train also driven by the energy converter to drive indirectly the hour and minute hands. The electromechanical energy converter disclosed is characterized by a wound stator having a plurality of magnetic circuits separately excitable to complete a magnetic path with a rotor. As the magnetic circuits are energized in succession, the rotor is attracted from one magnetic circuit to the next, producing stepwise rotation in synchronism with the excitation. A particular feature of the energy converter is the fact that its axial dimension is substantially less than its radial dimension, resulting in a flat configuration especially useful in a wrist watch.

3,621,314
REVERSIBLE OPERATING APPARATUS
Yoshio Murayama, and Masao Kamura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan
Filed June 2, 1970, Ser. No. 42,803
Claims priority, application Japan, May 23, 1969, 44/47757
Int. Cl. H02k *49/04*
U.S. Cl. 310—101 1 Claim

A reversible, variable-speed motor mechanism comprises a pair of two-phase induction motors rotating in opposite directions. The motors are coupled to a load by a pair of eddy-current coupling devices. The speed and direction of rotation of the load is controlled by comparing a setting



signal with a signal representative of the speed of the load and then altering the excitation current fed to the eddy-current coupling devices, in an offsetting manner, until the comparison signal is zero.

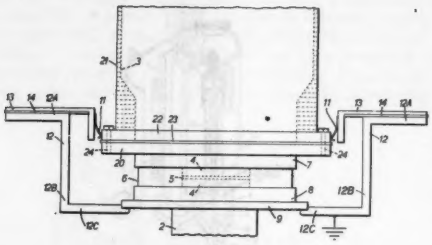
3,621,315
DAMPING WINDING FOR ROTATING POLE SYSTEM
Bror Dalmo, Vasteras; John Franked, Vasteras; Hans Landhult, Vasteras; Birger Nordberg, Vasteras; Carl Ronnevig, Vasteras, and Ove Tjernstrom, Irsta, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Dec. 4, 1969, Ser. No. 882,262
Claims priority, application Sweden, Dec. 23, 1968, 17,729/68
Int. Cl. H02k *19/26*
U.S. Cl. 310—183 1 Claim

In a pole system which has damping winding slots, a damping winding is positioned in the slots. This winding is formed of damping rods of electrically conducting material and cooling tubes arranged in the slots. The damping rods are connected outside the slots by short-circuiting rings. Each damping window slot contains at least one cooling tube and two adjacent part conductors. Each part conductor has a groove therein, and a cooling tube or tubes are arranged in the grooves. The part conductors are held in position and wedges inserted into the slots are locked in position.

3,621,316
MICROWAVE ELECTRON BEAM TUBES
Geoffrey Thomas Clayworth, Chelmsford, England, assignor to English Electric Valve Company Limited, London, England
Filed June 15, 1970, Ser. No. 46,120
Claims priority, application Great Britain, June 17, 1969, 30,566/69
Int. Cl. H01j *1/02*
U.S. Cl. 313—22 4 Claims

A microwave electron beam tube having a high-frequency interaction section insulated from the collector section of the tube by a gap across which the electron beam passes, the collector being surrounded by water contained in a boiler. The gap is shunted by a capacitor of solid material with its electrodes outside the evacuated envelope of the tube. The boiler is mechanically and electrically connected to a metal flange and a further flange is electrically and mechanically connected to the collector. Inserted between the two flanges is a

dielectric spacer which offers a high impedance to what would otherwise be large high-frequency current flowing between the two flanges thus reducing radiation from the boiler to a negligible level.

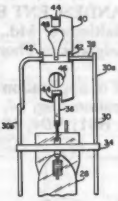


3,621,317

SPRING FLIP-TOP MOUNT SUPPORT FOR MERCURY VAPOR DISCHARGE LAMP

Robert E. Kerr, Chester, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 15, 1970, Ser. No. 46,382
Int. Cl. H01j *61/12, 61/52*
U.S. Cl. 313—25 **8 Claims**



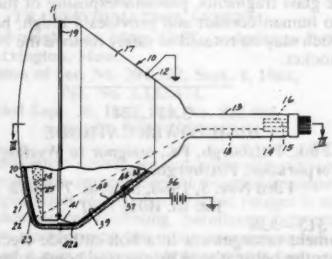
In a gas discharge lamp of the mercury vapor type, an improved upper support member for the arc tube mount assembly which comprises a leaf spring member rotatably secured to the upper crossbar element of the arc tube support frame which, during lamp assembly, enters the outer bulb in a position canted only slightly from axial alignment with the mount but rotates to a position perpendicular to the axis of mount assembly when in an assembled position against the top of the outer bulb to support and retain the arc tube mount in an axial position within the outer bulb.

3,621,318

COLOR TELEVISION PICTURE TUBE WITH METALLIC FILM COATING ON FUNNEL PORTION

Lothar J. Lewinson, Westmont, Quebec, Canada, assignor to Admiral Corporation, Chicago, Ill.

Filed Apr. 27, 1970, Ser. No. 31,934
Int. Cl. H01j *29/46*
U.S. Cl. 313—64 **5 Claims**



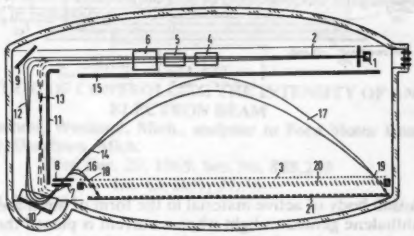
A cathode-ray tube for a color television receiver having an evacuated glass envelope which includes a faceplate panel, a funnel portion and a neck portion. The faceplate panel has a plurality of different color light-emitting phosphors thereon. A control electrode is positioned immediately adjacent the faceplate panel to assist in the excitation of the phosphor elements by appropriate electron beams. The control electrode takes the form of a shadow mask, and the phosphor elements are triads of blue, red and green light emitting phosphor dots. The shadow mask is supported at the inside of the faceplate panel by three springs which are mounted on bimetal "hinges" for adjustably positioning the shadow mask as temperature within the tube envelope changes. For instance, increases in temperature within the envelope tend to spread the openings in the shadow mask, and this is compensated by the effect of the bimetallic hinges which move the shadow mask in the direction of the faceplate panel. The tube envelope is coated with a vacuum-deposited aluminum layer which serves to prevent the build-up of high-voltage charges on the wall of the tube. Strips of a conductive colloidal graphite solution may be applied between certain critical points of electrical contact inside the tube envelope.

3,621,319

FLAT COLOR TELEVISION TUBE HAVING PLURALITY OF MIRROR DEFLECTION SYSTEMS

Hinrich Heynisch, Graefelfing; Hannjorg Bittorf, Munich, and Werner Veith, Munich, all of Germany, assignors to Printing Developments, Inc., Rockefeller Center, N.Y.

Filed June 26, 1968, Ser. No. 740,329
Claims priority, application Germany, June 27, 1967, S 110520
Int. Cl. H01j *29/74, 29/80, 31/20*
U.S. Cl. 313—77 **5 Claims**



An electron discharge tube for the display of luminous color images including a tube envelope having a picture screen electrode disposed adjacent to the viewing surface thereof. The picture screen electrode has a plurality of luminous strips arranged substantially parallel to one another. A pair of grids are arranged behind the picture screen electrode and a recoil electrode is spaced behind the pair of grids. The first of the pair of grids consists of a plurality of narrow parallel strips sloping against the picture screen electrode. The electron beam is directed into the space between the picture screen electrode and the recoil electrode in a direction generally away from the picture screen electrode. The potential of the recoil electrode reverses the direction of the beam toward the picture screen electrode and through the pair of grids.

3,621,320

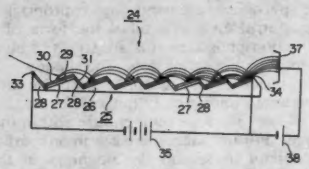
SECONDARY ELECTRON MULTIPLIER CONSISTING OF SINGLE SAWTOOTH MULTIPLYING SURFACE

Haruo Maeda, Osaka, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed May 27, 1969, Ser. No. 828,277
Claims priority, application Japan, May 31, 1968, 43/37665
Int. Cl. H01j *43/04, 43/18, 43/20*
U.S. Cl. 313—105 **5 Claims**

A secondary electron multiplier comprising a supporting plate having two kinds of inclined surfaces, one of which has a coating of low-resistance material and on which coating a secondary emissive layer is formed, the other of which has a coating of high-resistance material, the low-resistance and

high-resistance coatings forming a series circuit across which a voltage source is connected so that a repeller electric field



which serves to accelerate secondary electrons is built up around the surfaces of said secondary emissive layers.

3,621,321

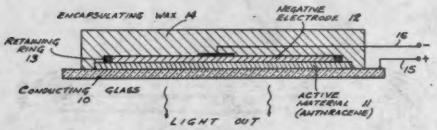
ELECTROLUMINESCENT DEVICE WITH LIGHT EMITTING AROMATIC, HYDROCARBON MATERIAL

Digby F. Williams, Ottawa, and Martin Schadt, Vanier City, Ontario, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Oct. 28, 1969, Ser. No. 871,847

Int. Cl. H05b *33/02, 33/26*

U.S. Cl. 313—108 A **6 Claims**



A thin body of active material in the form of anthracene or naphthalene generates light when a current is passed through it by the injection of electrons from an electrode containing negative ions of a similar material e.g. anthracene, naphthalene or tetracene) to a base electrode to which an external positive potential relative to the electron-injecting electrode is applied. The base electrode may be solid and transparent for transmission of light generated in the active material or at its interface with the base electrode. This device also acts as a rectifier, since virtually no current will flow if the externally applied potential is reversed.

ERRATUM

For Class 313—108 D see:
Patent No. 3,621,340

3,621,322

HIGH-PRESSURE COMPACT ARC LAMP WITH ELECTRODES CONTAINING TANTALUM CARBIDE

Manfred Rehmet, and Jurgen Begemann, both of Munich, Germany, assignors to Patent-Treuhand-Gesellschaft Fuer Elektrischi Gluehlampen mbH, Munich, Germany

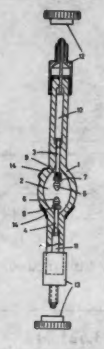
Filed Sept. 2, 1969, Ser. No. 854,452

Claims priority, application Germany, Sept. 12, 1968, P 17 64 961.5

Int. Cl. H01j *61/06, 61/12*

U.S. Cl. 313—184 **8 Claims**

A high-pressure compact arc lamp with an envelope which is substantially spherically bulbous where the discharge occurs, and having opposed aligned electrodes therein spaced from each other a distance less than the distance of the bulb wall therefrom at a plane transverse to and between the ends of said electrodes, both of the electrodes comprising sintered bodies composed of from 20 to 90 percent by weight of tantalum carbide and from 80 to 10 percent by weight of at least one metal from the group of tungsten, rhenium, molybdenum and tantalum.



3,621,323

COATED INCANDESCENT ELECTRIC LAMP

Frank W. Thomas, Baltimore, Md., and William R. Tooke, Jr., Atlanta, Ga., assignors to Thomas Manufacturing Company, Parkton, Md.

Continuation-in-part of application Ser. No. 725,568, Apr. 12, 1968. This application Aug. 14, 1969, Ser. No. 860,139

Int. Cl. H01j *5/04, 19/56, 19/57*

U.S. Cl. 313—317 **1 Claim**

An incandescent electric lamp including an elastomeric coating extending continuously over the glass envelope of the lamp and down over the upper portion of the metallic base by at least ⅛th of an inch. Such a coating creates an electrically safe, substantially shatterproof pod which is affixed to the metallic base. Upon accidental, inadvertent or intentional shattering of the glass envelope, the coating has sufficient strength and body to retain its shape as an electrically safe pod which is attached to the metallic base. The pod thus contains the glass fragments, prevents exposure of the lamp filaments to human contact and provides a tough, homogenous body which may be rotated to safely remove the broken lamp from a socket.

3,621,324

HIGH-POWER CATHODE

Joel H. Fink, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

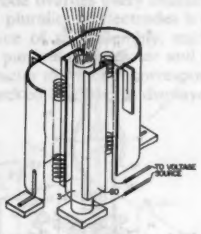
Filed Nov. 5, 1968, Ser. No. 773,542

Int. Cl. H01j *1/20*

U.S. Cl. 313—338 **7 Claims**

A filament arrangement in a bolt-cathode electron source that heats the bolt-cathode by electron bombardment causing the bolt-cathode to emit a beam of electrons. The filaments are positioned adjacent to the bolt-cathode and at a distance

from the bolt-cathode sufficient to render the geometry of the bolt-cathode independent from the geometry of the filaments and the current flow in the filaments insensitive to the temperature of the filament.

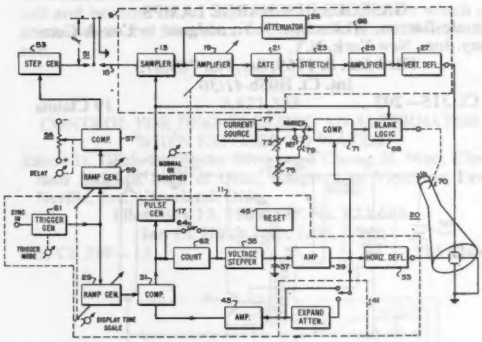


3,621,325

TIME DELAY REFLECTOMETER

Lee R. Moffitt, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 28, 1969, Ser. No. 853,788
Int. Cl. H01j *29/72*
U.S. Cl. 315—25 **8 Claims**



A sampling circuit for an oscilloscope includes feedback circuitry to the sampling gate for enhancing the sampling efficiency and also includes a sweep generator that produces stepwise increment of sweep voltage per selected number of samples. The sampling efficiency may be decreased and the number of samples per step may be increased to provide an averaging effect on the samples taken of noisy signals. Also, selective delay may be introduced between generation of a test pulse used, for example, to step-response test a circuit element and the initiation of a sweep cycle.

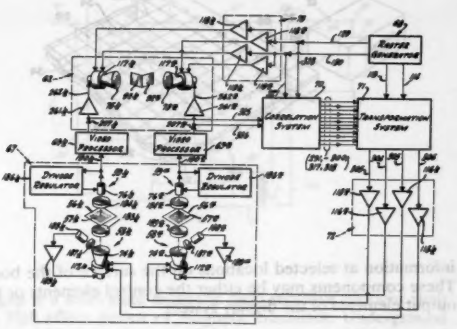
3,621,326

TRANSFORMATION SYSTEM

Gilbert L. Hobrough, Los Altos, Calif., assignor to Itek Corporation, Lexington, Mass.

Division of Ser. No. 394,502, Sept. 4, 1964, Pat. No. 3,432,674.
Filed Sept. 30, 1968, Ser. No. 822,086
Int. Cl. H01j *29/76*
U.S. Cl. 315—26 **5 Claims**

A photogrammetric system for automatically registering a pair of photographic images for stereographic inspection. Automatic registration of the photographic images is accomplished by electronically sensing parallaxes between the images, and by transforming the images to accomplish registration. Each of a pair of stereo photographs is scanned in *x* and *y* by a separate flying spot scanner which is driven by *x* and *y* raster generators. The output of each of the flying spot scanners is applied to a separate video processor for controlling and enhancing the image signals and then to a separate cathode-ray tube which is driven in *x* and *y* by the same *x* and *y* raster generators. The two cathode-ray tubes comprise the left and right sides of a binocular viewer. The output of each of the flying spot scanners and the *x* and *y* raster signals are applied to a correlation system which detects parallax errors and first and second order distortions



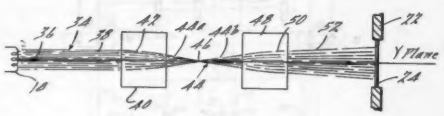
between corresponding sections of each of the photographic images. The correlation system divides the output signals of the flying spot scanners into different frequency band-pass regions for separate correlation of the components of each of the signals in each band-pass region. The output of the correlation system is applied, via a transformation system, as correction signals to the raster signals driving the flying spot scanners which enables the pair of photographic images to be viewed in registration.

3,621,327

METHOD OF CONTROLLING THE INTENSITY OF AN ELECTRON BEAM

Zia Hashmi, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 29, 1969, Ser. No. 888,279
Int. Cl. H01j *29/56*
U.S. Cl. 315—31 **7 Claims**



A method for controlling the cross-sectional area and intensity of an electron beam produced in an electron accelerator. A first constant electric field is applied to the beam causing dispersal of the beam in a first plane and concentration of the beam in a second plane disposed perpendicular to the first plane. Subsequently, a second constant electric field is applied to the beam causing beam concentration in the first plane and beam dispersal in the second plane. The fields are applied to the beam between the origin of the beam and the accelerator window and provide that the cross-sectional area of the beam greatly is enlarged at the point of intersection of the beam and the window relative to its original dimensions.

3,621,328

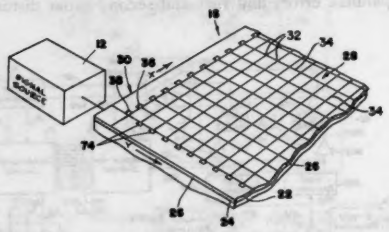
INFORMATION DISPLAY SYSTEM

Max Epstein, Highland Park, Ill.; David Fryberger, Palo Alto, Calif.; Robert J. Serafin, Highland Park, and Anthony P. Van Den Heuvel, Homewood, Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed May 13, 1969, Ser. No. 824,047
Int. Cl. H04n *5/38*
U.S. Cl. 315—55 **9 Claims**

An information display system is provided which comprises a body of material serving as both a substrate for thin film

components and a medium for the propagation of Rayleigh acoustic waves along its surface. The thin film components include elements responsive to the Rayleigh waves to provide



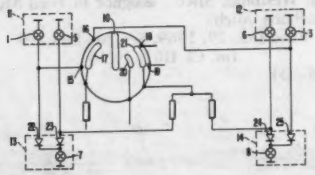
information at selected locations on the surface of the body. These components may be either the control elements or the output elements of the display system.

3,621,329

PARKING LIGHT SYSTEM FOR MOTOR VEHICLES

Egon Frey, Stuttgart-Degerloch, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 12, 1968, Ser. No. 783,188
Claims priority, application Germany, Dec. 12, 1967, P 16 30 398.3
Int. Cl. B60q *1/48*
U.S. Cl. 315—77 **4 Claims**



A parking light system for motor vehicles employs individual lamp elements which serve as both parking lights and as the vehicle boundary and taillights. To selectively energize the lights on one side of the vehicle, while preventing the energization of lights on the opposite side of the vehicle, a diode arrangement is connected between the light power system and the light-actuating switch.

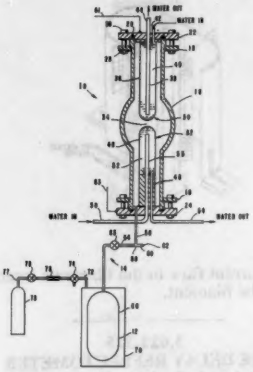
3,621,330

DEPRESSURIZATION OF ARC LAMPS

Charles G. Miller, Los Angeles, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed July 14, 1969, Ser. No. 841,278
Int. Cl. H01j *61/28*
U.S. Cl. 315—108 **19 Claims**

A closed cycle depressurization system including a lamp envelope for containment of a discharge gas at greater than atmospheric pressure in communication with a gas storage and depressurization chamber. A substantially transparent material, potentially frangible at said pressure forms at least a portion of the envelope. In one embodiment, depressurization is effected by externally cooling the walls of the chamber and in a second embodiment the chamber contains a gas adsorbent which adsorbs gas to reduce the pressure in the lamp envelope to the desired safe nonoperating level. Repressurization is accomplished by raising the temperature of the



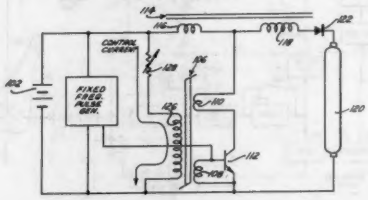
chamber and the stored gas and recycling the gas to the envelope.

3,621,331

ARRANGEMENT FOR IGNITING AND OPERATING GASEOUS DISCHARGE LAMPS

Benjamin Barron, Whitestone, N.Y., assignor to Cox & Company, Inc., New York, N.Y.

Filed Jan. 8, 1969, Ser. No. 789,873
Int. Cl. H05b *41/30*
U.S. Cl. 315—207 **19 Claims**



An arrangement for applying a train of pulses to a gaseous discharge lamp, so that each pulse has imparted to it the characteristics required for igniting the lamp and maintaining the latter in operation after ignition. A switching transistor operated by a pulse train derived from a pulse generator, applies its output pulses to a transformer with its secondary winding applied across the base-emitter path of the transistor. An inductor connected to the primary winding of the transformer and to the lamp to be operated, applies breakdown voltage to the lamp when the transistor is turned off. The inductor stores energy for transfer to the lamp once the latter has been ignited through the striking of an arc. Dimming of the lamp is accomplished by varying the energy imparted to the individual pulses or by varying the repetition rate of the pulses without incurring energy losses in the process.

3,621,332

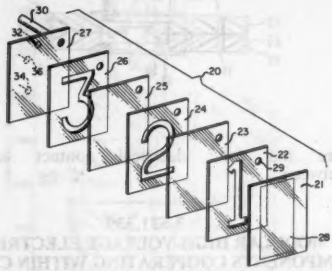
STACKED PLATE VISUAL DISPLAY PANEL

John L. Janning, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Nov. 24, 1969, Ser. No. 879,125
Int. Cl. H05b *41/00*
U.S. Cl. 315—313 **17 Claims**

An electroluminescent display device comprising an assembly of stacked transparent dielectric plates, in which every other plate includes a channel forming a cell having a particular character configuration. Each cell is insulated

from every other cell, and each contains an electroluminescent material. A transparent film electrode is deposited on the front surface of the plate assembly in such a manner that the film electrode overlies every character configuration in the assembly. A plurality of electrodes is deposited on the rear exterior surface of the assembly, each electrode corresponding to one particular character and overlying only a portion of the character to which it corresponds. A particular character in the stacked assembly is displayed by alternately



energizing the film electrode and the electrode corresponding to the desired character. Only that character which is positioned between the film electrode and the selected character electrode will be affected by the alternating field because of the capacitive coupling effect which exists between the character electrode and the selected character cell and because of the capacitive coupling effect which exists between the film electrode and the selected character cell.

3,621,333

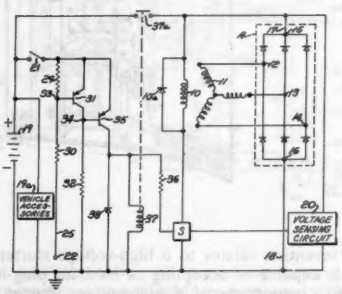
CONTROL FOR DEENERGIZING AN ALTERNATOR WHEN EXPOSED TO WATER

Albert D. Gilchrist, Rocky River, and Chung H. Woo, Cleveland Heights, both of Ohio, assignors to Victoreen Leece Neville, Inc., Cleveland, Ohio

Filed May 12, 1969, Ser. No. 823,686

Int. Cl. H02h *7/06, 7/08, 7/10*

U.S. Cl. 317—13 **13 Claims**



Control for an alternator having a water sensor which causes the alternator field winding to be deenergized whenever fresh water or slat water is present, thereby avoiding corrosion of the alternator windings by electrolysis.

3,621,334

GROUND FAULT SENSING CIRCUIT

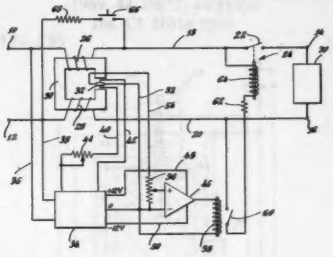
Edward P. Burns, West Redding, and Sung C. Lee, Bridgeport, both of Conn., assignors to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Jan. 21, 1970, Ser. No. 4,676

Int. Cl. H02h *7/26, 3/28*

U.S. Cl. 317—18 D **12 Claims**

There is disclosed a ground fault sensing circuit usable with either AC or DC circuits. It includes a closed loop magnetic core having a gap. Two windings are disposed on the core in series, respectively, with the different conductors supplying the load. The windings are arranged in such a manner that, when the currents in the conductors are equal, there is no magnetic flux produced in the core and gap. Positioned in



the gap is a solid state magnetic field sensitive element such as a Hall effect device or magnetic transistor. Underground fault conditions, a magnetic field appears across the gap and an output signal is generated by the solid state device. This signal is amplified and trips a circuit breaker in series with the load.

3,621,335

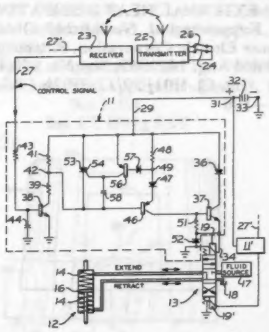
DRIVER CIRCUIT FOR ENERGIZING AN ELECTRICAL LOAD IN RESPONSE TO SIGNALS FROM A REMOTE SOURCE

Donald F. Coleman, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1970, Ser. No. 78,438

Int. Cl. H02h *3/08*

U.S. Cl. 317—16 **6 Claims**



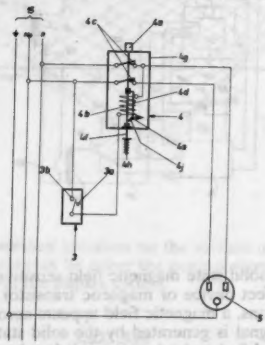
A solid-state circuit provides for energizing an electrically operated device in response to control signals from a remote source, the circuit being suitable for such purposes as controlling a vehicle through radio signals or through an umbilical cord. The circuit includes means which conducts current form a DC power supply to the electrical device in the presence of the remote signal and which deenergizes the device in the absence of the signal and further includes means which rapidly interrupts the connection between the power supply and electrical device if an overcurrent occurs from a short circuit or other malfunction. The protective means resets upon termination of the remote signals as well as upon interruption of the connection to the power supply so that attempts to reactivate the electrical device may be made through subsequent signals from the remote location.

3,621,336

CABLE REEL WITH MEANS FOR GUARDING AGAINST OVERHEATING OF CONVOLUTED CABLE

Wolfgang Angermeyer, Ittersbach Karlsruhe, Germany, assignor to Desco-Werk Seger & Angermeyer KG, Ittersbach Karlsruhe, Germany

Filed May 20, 1970, Ser. No. 39,058
Int. Cl. H02h 5/04
U.S. Cl. 317—40 R 10 Claims



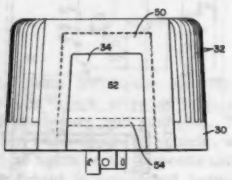
A reel for a supply of electric cable has hollow core accommodating a normally closed interrupter switch which is installed in the conductors of the cable between an energy source and one or more consumers. The interrupter switch opens when a temperature-responsive switch which is outwardly adjacent to or recessed into the core closes in response to detection of a predetermined maximum permissible temperature of convolutions which surround the core. The rise in temperature of the convolutions is caused by generation of heat in response to power losses due to conductor resistance.

3,621,337

SOLID-STATE PHOTOCONTROL HOUSING ASSEMBLY WITH EXTERNAL HEAT DISSIPATING RIBS

George A. Kappenhagen, Northfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 14, 1969, Ser. No. 850,186
Int. Cl. H01j 39/12; H02b 1/10
U.S. Cl. 317—100 3 Claims



A housing configuration for a solid-state photocontrol which includes external heat dissipating ribs, internal heat sink and locating members for the circuit elements, a light-transmissive window and a bottom, electrical connector carrying closure.

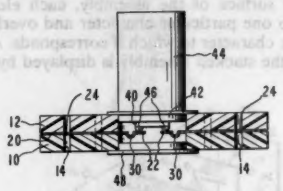
3,621,338

DIAPHRAGM-CONNECTED, LEADLESS PACKAGE FOR SEMICONDUCTOR DEVICES

Bryant C. Rogers, La Jolla, and Wilbur T. Wakely, San Diego, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Syosset, N.Y.

Filed Jan. 2, 1970, Ser. No. 346
Int. Cl. H05k 1/014
U.S. Cl. 317—101 CC 8 Claims

A thin patterned conductive foil is embedded between a pair of adjacent dielectric layers, at least one of which has a hole pattern therein. Portions of the foil cover the holes, so that upon insertion of conductive material into the holes to puncture the foil, electrical contact is provided therebetween.

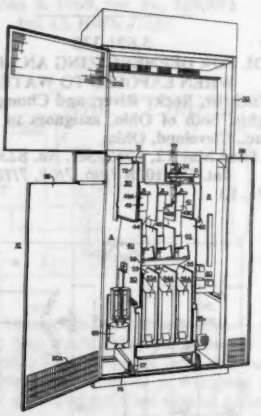


3,621,339

MODULAR HIGH-VOLTAGE ELECTRICAL COMPONENTS COOPERATING WITHIN CABINET HOUSING TO PROVIDE ELECTRICAL INSULATION AND COOLING AIR PASSAGE

Alfred W. Hodgson, Orchard Park, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 21, 1970, Ser. No. 30,409
Int. Cl. H02b 1/04
U.S. Cl. 317—103 4 Claims



The invention relates to a high-voltage starter apparatus which is capable of accepting as modular plug-in units the standard components of a high-voltage starter such as a power fuse assembly, a contactor assembly and an isolating switch assembly while isolating the low-voltage control circuitry associated with the high-voltage starter so as to provide safe, separate access to the low-voltage circuitry.

3,621,340

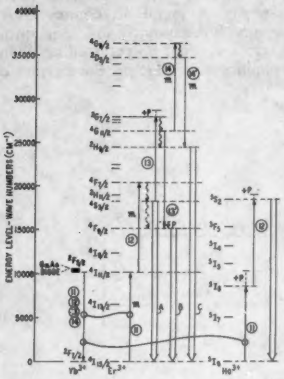
GALLIUM ARSENIDE DIODE WITH UP-CONVERTING PHOSPHOR COATING

Shobha Singh, Summit, and LeGrand G. Van Uitert, Morris Township, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1969, Ser. No. 816,764
Int. Cl. H01j 1/62, 63/04; H01s 3/00
U.S. Cl. 313—108 D 9 Claims

Adjustable color in the visible spectrum results from use of a gallium arsenide infrared emitting diode provided with a

coating of a composition having at least one each of two different anions in some unit cells. The composition exemplified



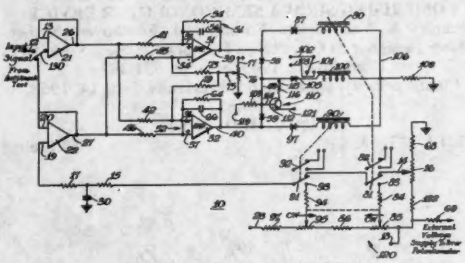
by a variety of oxyhalides contain the cation pair Yb^{3+}–Er^{3+}, Yb^{3+}–Ho^{3+} and mixtures thereof.

3,621,341

CONTROL APPARATUS

Eugene H. Lombardi, Port Chester, N.Y., assignor to Ethyl Corporation, New York, N.Y.

Filed May 20, 1968, Ser. No. 730,234
Int. Cl. H01h 9/00; G01l 23/22; H01h 47/00
U.S. Cl. 317—157 9 Claims



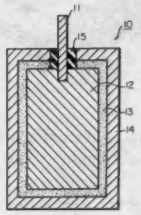
Automatic gasoline antiknock measuring control that delivers compensating action roughly proportioned to knock intensity departure from standard, the action being continued so long as departure from standard increases at a rate at least as high as a predetermined minimum rate. Compensating action can be used to adjust compression ratio of knock-testing engine, or adjust blending of knock-reducing ingredient into gasoline. Dependable operation is obtained by having all solid-state components with differential amplification doing the error-detection sensing. Control can have a pair of all solid-state operational differential amplifiers with their inputs crossconnected and a dead band bias circuit also connected to these inputs, the set point source having a capacitor connected for charging by a selected voltage and for applying the capacitor voltage through a voltage follower to a comparison input of the amplifiers, the outputs being connected to raise the capacitor-charging voltage when the signals measured are too high and lower the capacitor-charging voltage when the signals are too low.

3,621,342

SOLID ELECTROLYTIC CAPACITOR WITH γ-M_nO_2 ELECTROLYTE

Susumu Yoshimura; Katsue Hasegawa; Yoshio Yamamoto, and Iwao Tajima, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed June 18, 1970, Ser. No. 47,475
Claims priority, application Japan, June 20, 1969, June 27, 1969, 44/49872; 44/51989
Int. Cl. H01g 9/05
U.S. Cl. 317—230 14 Claims



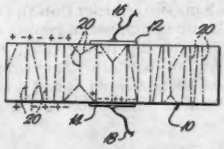
A solid electrolytic capacitor including a first electrode having formed an oxide film on its outer surface, a second electrode disposed opposite to the first electrode and a solid electrolyte composed substantially of granular manganese dioxide of gamma type and disposed in contact and between the first and second electrodes. The solid electrolyte has a high film-forming ability and is prepared by electrolyzing manganese sulfate dissolved in an aqueous solution of sulfuric acid. The solid electrolytic capacitor is capable of operating stably over a broad temperature range and for a prolonged period of time even when it is placed on use at a high-operating temperature.

3,621,343

POLAR VAPOR SENSING MEANS

Charles F. Pulvari, Washington, D.C., and Stephen F. Urban, Kenmore, N.Y., assignors to NL Industries, Inc., New York, N.Y., by said Urban

Continuation-in-part of application Ser. No. 709,642, Mar. 1, 1968, now abandoned. This application Jan. 23, 1970, Ser. No. 5,354
Int. Cl. H01g 9/00
U.S. Cl. 317—231 18 Claims

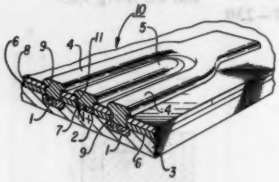


The sensing means comprises a body of metal oxide dielectric material having an active surface layer exhibiting surface conductive characteristics wherein the resistivity of the surface layer varies in the presence of a polar vapor and wherein the resistivity of the surface layer varies between a first condition in the absence of water vapor and a second condition in the presence of water vapor by a factor on the order of 1: 10,000 or more. At least two separate spaced electrically conductive electrodes are electrically connected with portions of the surface layer. Means is provided for impressing an AC voltage across said electrodes, and a load impedance is connected in series therewith from which an output signal can be derived.

3,621,344
TITANIUM-SILICON RECTIFYING JUNCTION

William M. Portnoy, 4227 53rd St., Lubbock, Tex., and Hayden M. Leedy, Jr., 1616 Westridge, Plano, Tex.

Filed Nov. 30, 1967, Ser. No. 686,984
Int. Cl. H01l 5/00, 7/02
U.S. Cl. 317—234 3 Claims

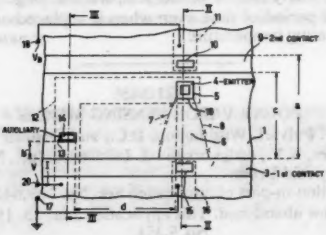


Disclosed is a metal semiconductor rectifying junction comprising a layer of titanium metal in electrical contact with a silicon surface.

3,621,345
SEMICONDUCTOR DEVICE HAVING A BISTABLE CIRCUIT ELEMENT

Wolfdietrich Kasperkovitz, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,758
Claims priority, application Netherlands, Apr. 4, 1968, 6804787
Int. Cl. H01l 11/18, 11/00
U.S. Cl. 317—235 27 Claims



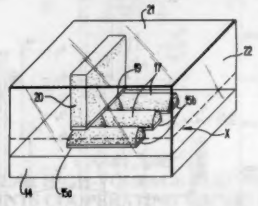
A semiconductor device having a bistable semiconductor circuit element with an I–V characteristic exhibiting three branches having a positive differential resistance is described. The bistable circuit element comprises first and second contacts between which majority carrier flow in the semiconductor is established. It also comprises an emitter for establishing minority carrier flow to the first contact to conductivity modulate the region in between. The emitter is located between the first and second contacts and is connected to an auxiliary contact located outside the region of conductivity modulation.

3,621,346
PROCESS FOR FORMING SEMICONDUCTOR DEVICES WITH POLYCRYSTALLINE DIFFUSION PATHWAYS AND DEVICES FORMED THEREBY

Joseph J. Chang, Clearwater Beach, Vt., and Madhukar B. Vora, Beacon, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1970, Ser. No. 6,493
Int. Cl. H01l 11/00
U.S. Cl. 317—235 6 Claims

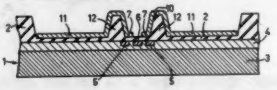
A process wherein epitaxial silicon is grown on a substrate of single-crystal silicon with islands of silicon dioxide thereon, whereby single crystal epitaxial material is grown over the single-crystal substrate areas, but polycrystalline silicon is grown over the silicon dioxide islands. Since impurity diffusion occurs more rapidly through polycrystalline material than through single-crystalline material diffusion schemes can be obtained using the rapid diffusion pathway provided by the polycrystalline material to provide subsurface configurations which are completely enclosed by single-crystal material, for instance, a buried subcollector can be formed by growing polycrystalline silicon material horizontally, extending a narrow polycrystalline channel upward to the device surface, and subsequently diffusing impurities down through the narrow vertical polycrystalline channel into the lateral polycrystalline subcollector. Further, an electrical underpass can be formed which has a very low resistance by again using the rapid diffusion characteristics of polycrystalline silicon to grow polycrystalline silicon of the desired shape which can be rapidly diffused to provide, in comparison to background, a high conductivity path.
By control of the substrate crystalline orientation, polycrystalline material can be grown which terminates because of sidewall convergence. This is desirable where it is required to terminate polycrystalline growth and begin single-crystal growth without any alteration in process conditions. The devices described are also claimed.



3,621,347
SEMICONDUCTOR DEVICE COMPRISING A FIELD EFFECT TRANSISTOR HAVING AN INSULATED GATE ELECTRODE AND CIRCUIT ARRANGEMENT COMPRISING SUCH A SEMICONDUCTOR DEVICE

Johannes A. Van Nielen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 9, 1969, Ser. No. 831,397
Claims priority, application Netherlands, June 14, 1968, 6808352
Int. Cl. H01l 11/14
U.S. Cl. 317—235 R 17 Claims



An insulated gate field-effect transistor having a decoupling capacitor between the gate and substrate.

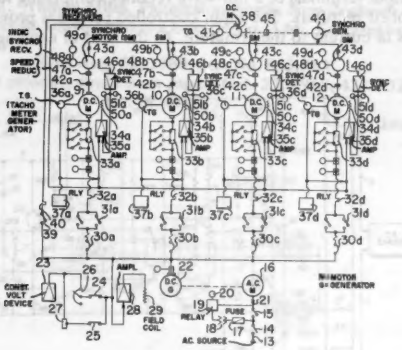
3,621,348
CONTROL SYSTEM FOR AUTOMATIC OPERATION OF A PRESS LINE

Toshiyuki Uchida; Hisashi Miyakoshi, and Shinichi Murai, all of Komatsu-shi, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Minato-ku, Tokyo-to, Japan

Filed July 3, 1969, Ser. No. 838,900
Claims priority, application Japan, Sept. 18, 1968, 43/67106
Int. Cl. H02p 5/46
U.S. Cl. 318—77 2 Claims

An operating method of press line including a row of presses each having a specific working region assigned thereto, and transfer feeders interposed between the presses,

said press lines being adapted to produce formed articles, each of said presses are operated automatically at equalized



speed, or each of said presses and each of said transfer feeders are operated synchronously.

3,621,349

LINEAR INDUCTION MOTOR SYSTEM FOR SLIDING DOOR PANEL MOVEMENT CONTROL

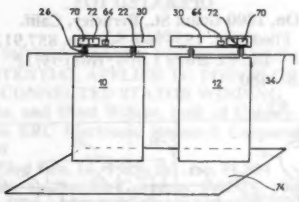
Philippe Reyx, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme of Rue Henri Tarze, Grenoble, France

Filed June 23, 1970, Ser. No. 49,049

Claims priority, application France, July 2, 1969, 6,922,905

Int. Cl. H02k *41/02*

U.S. Cl. 318—135 **5 Claims**



A system for opening and closing sliding doors comprising a linear induction motor having two field windings, a braking device, a plurality of detectors actuated in accordance with the position of the door and a switch sensitive to the approach of persons or objects toward the door. A control circuit is provided which controls the direction of movement and speed of the door as a function of the positions of the detectors and switch by selectively actuating the field windings and braking device.

3,621,350

TIME INTEGRAL CONTROL SYSTEM

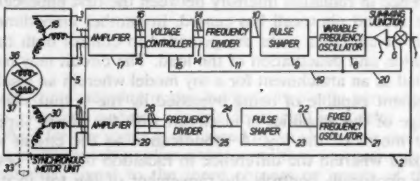
John Michael Masterman, Churchdown, England, assignor to Dowty Rotol Limited, Gloucester, England

Filed June 19, 1969, Ser. No. 834,636

Claims priority, application Great Britain, June 19, 1968, 29,251/68

Int. Cl. H02p *5/34*

U.S. Cl. 318—171 **5 Claims**



A control system in which an output member is moved in accordance with the time integral of the magnitude and sense of variation relative to its datum of an input signal. The input signal is arranged to control an oscillator means to generate two alternating currents of much greater frequency than the highest frequency of the input signal such that the frequency difference between the alternating currents is in accordance with the magnitude and sense of the input signal. The alternating currents are arranged to drive a synchronous motor means in which an output member is moved at a speed in proportion to the frequency difference between the two alternating currents.

3,621,351

CONTROLLED INDUCTION MOTOR DEVICE

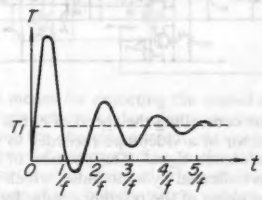
Tatsuo Goto, Hachioji-shi; Yoryo Matsudo, Chiba-shi, and Hiroshi Watanabe, Hitachi-shi, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Aug. 28, 1968, Ser. No. 755,964

Claims priority, application Japan, Sept. 1, 1967, 42/55748

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **9 Claims**



A controlled induction motor device employs a three-phase induction motor whose rotor has a rotor winding of a relatively large resistance to reduce the electrical time constant of the rotor to be equal to or less than the reciprocal of the frequency of the three-phase AC power which is supplied to the motor. A controllable rectifier is inserted in one of the three-phase AC power lines supplying power to the motor in order to intermittently supply the three-phase power to the motor, whereby the motor can be rotated at low speeds without vibration.

3,621,352

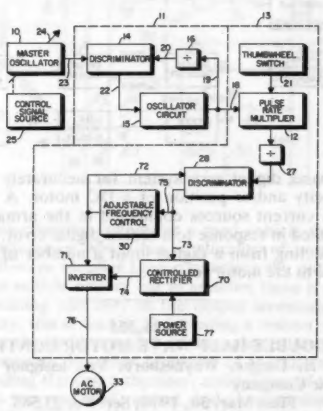
INVERTER-CONTROL SYSTEM FOR AC MOTOR WITH PULSE-LOCKED CLOSED LOOP FREQUENCY MULTIPLIER

Edward H. Dinger, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 19, 1969, Ser. No. 808,443

Int. Cl. H02p *5/40*; **H02m** *7/20*

U.S. Cl. 318—227 **8 Claims**



The invention is a closed loop pulse-locked frequency multiplier. A master pulse train is applied to a digital discrimina-

tor, the output of which is in turn applied to a voltage controlled oscillator. The oscillator generates a pulse train having a repetition rate that is a multiple of the repetition rate of the master pulse train. The generated pulse train is fed back to the digital discriminator by a divider having a dividing factor equal to the multiplying factor of the oscillator.

3,621,353

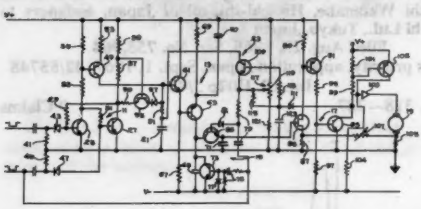
PHASE LOCK, SPEED CONTROL SYSTEM

Joseph Brian Matley, Monte Sereno, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 14, 1969, Ser. No. 876,777

Int. Cl. H02p *5/06*

U.S. Cl. 318—314 **6 Claims**



A system for controlling the speed of either a capstan or a head drum motor in a videotape recorder to phase lock the motor to a reference signal. The position of the capstan or drum motor is indicated by a tac pulse, which is compared in phase with the phase of the reference pulse by a phase detector which provides an output signal corresponding to the phase difference. The output signal from the phase detector is converted to current in a voltage-to-current converter and the current is fed to a sampling filter. The output from the sampling filter is employed to control the speed of the drum or capstan motor through a power amplifier. To provide long term position stability, an integrating capacitor is connected to the output of the phase detector. During the motor acceleration period, this integrating capacitor is clamped to a DC voltage approximately equivalent to the correct running speed of the capstan or drum motor.

3,621,354

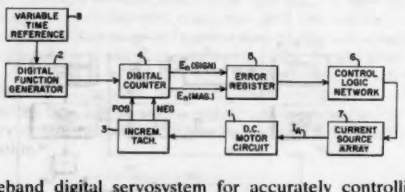
DC MOTOR CURRENT ACTUATED DIGITAL CONTROL SYSTEM

James W. Fawcett, E. Syracuse; John M. Irwin, Clay, and Robert J. McFadyen, Syracuse, all of N.Y., assignors to General Electric Company

Filed Jan. 7, 1970, Ser. No. 1,233

Int. Cl. G05b *5/01*

U.S. Cl. 318—341 **8 Claims**



Wideband digital servosystem for accurately controlling the velocity and/or position of a DC motor. A plurality of constant current sources connected in the armature circuit are actuated in response to a sensed digital error, determined by subtracting from a digital input a number of pulses proportional to the motor rotation.

3,621,355

DOUBLE HALF WAVE MOTOR CONTROL

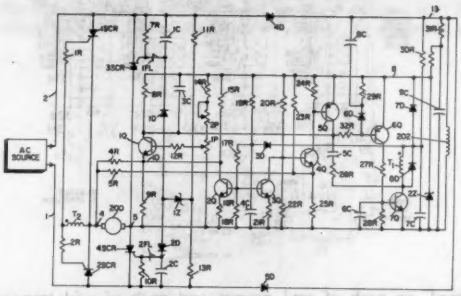
Edward H. Dinger, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 30, 1970, Ser. No. 23,585

Int. Cl. H02p *5/16*

U.S. Cl. 318—345 **18 Claims**

A control circuit for a DC motor pulses the motor armature every half cycle, but maintains a discontinuous armature current as in a half wave motor control circuit. The assurance of discontinuity allows the motor e.m.f. to be used as a speed feedback voltage. The armature is placed across the output terminals of a full-wave rectifier comprising four controlled rectifiers. The input controlled rectifiers provide pulses of current to the armature. At the start of each half cycle



the turn-on time of the output controlled rectifiers is delayed. With the latter controlled rectifiers turned off at the beginning of each half cycle, there is no current path which allows the armature current to decay slowly. The armature current is forced to go rapidly to zero and discontinuity of the armature current is assured.

3,621,356

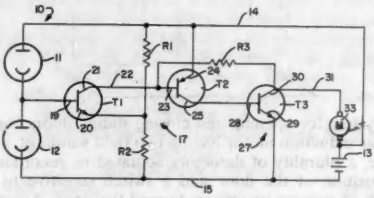
PHOTOCELL CONTROL CIRCUIT FOR MOTOR-OPERATED TOY

Kwan Chi On, 1800 Grant St., Berkeley, Calif.

Filed Sept. 15, 1969, Ser. No. 857,912

Int. Cl. H02p *11/00;* **H01j** *39/12*

U.S. Cl. 318—480 **14 Claims**



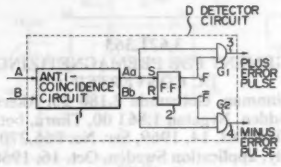
An electric circuit responsive to a difference in the intensity of radiation, such as light, between two positions, for controlling the operative state of a load. The circuit includes a pair of series-connected photocells which provide the input to a solid state amplifier which includes an output stage acting as a switch. In one embodiment, the output switching stage is in series circuit with a source of power and a motor mounted on a toy, such as a vehicle, so that the motor is actuated when the switching stage is conducting. Feedback means are provided in circuit with the amplifier and the switching stage so that the operative state of the load, such as the operation of the toy motor, is maintained after the difference in radiation intensity between the first photocell and the second photocell has ceased. In another embodiment, a pair of amplifier paths are provided to control both the actuation and deactuation of the load. The circuit may be provided as an attachment for a toy model wherein an insulating element capable of being bypassed by the output switching stage of the amplifier is in circuit with the power supply to the motor of the toy. A modification to the circuit is disclosed wherein the difference in radiation intensity between the photocells controls the movement of the toy in its forward, reverse, left, or right directions without the need for using reversing relays.

3,621,357

APPARATUS PROCESSING PULSE NUMBERS FOR USE IN A PID DIGITAL CONTROL SYSTEM

Moritada Kubo, Tokyo; Yukiharu Takahashi, Tokyo, Japan, and T. William Miles, Palmerston North, New Zealand, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 28, 1969, Ser. No. 853,813
Claims priority, application Japan, Oct. 25, 1968, 43/77321
Int. Cl. G05b *19/26*
U.S. Cl. 318—600 10 Claims



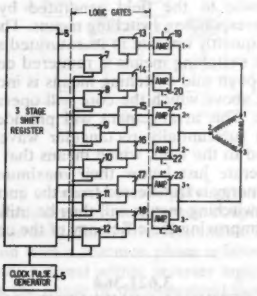
Apparatus for obtaining the proportional difference between two pulse trains by feeding input pulses of the two pulse trains to an anticoincidence circuit, which blocks the passage of only coincidence inputs the outputs from which are supplied to a combining circuit including a flip-flop circuit and a pair of AND gate circuits, thereby canceling the first of the alternately reached pulses in two trains to obtain the rest of the pulses. By combining the apparatus with a step motor and delay circuits the integral difference and differential difference may be obtained.

3,621,358

STEPPING MOTOR HAVING POSITIVE, NEGATIVE OR ZERO POTENTIAL APPLIED TO POINTS OF DELTA CONNECTED STATOR WINDING

Kurt Hinrichs, and Gerd Wilken, both of Coburg, Germany, assignors to ERC Electronic Research Corporation, Basel, Switzerland

Filed Feb. 16, 1970, Ser. No. 11,804
Claims priority, application Germany, Feb. 15, 1969, P 19 07 762.4 Germany, Nov. 19, 1969, P 19 58 032.6
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 8 Claims



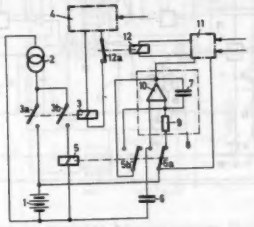
An electrical stepping motor having a two-pole permanent magnet rotor and a stator winding connected in a delta. The rotary field for the stator is produced by an electronic circuit which simultaneously applies either a positive, a negative or a zero potential signal to the three corners or inputs of the delta winding in a predetermined sequence whereby 12 steps per revolution are achieved.

3,621,359

METHOD OF DETECTING THE END-OF-CHARGE CONDITION OF AN ELECTRIC STORAGE BATTERY UNDER CHARGE AND DEVICE FOR THE CARRYING OUT OF THIS METHOD

Kurt Schnegg, Yverdon, Switzerland, assignor to Leclanche S. A., Yverdon Canton of Vaud, Switzerland

Filed Mar. 23, 1970, Ser. No. 21,947
Claims priority, application Switzerland, Mar. 28, 1969, 4761/69
Int. Cl. H02j *7/00*
U.S. Cl. 320—43 12 Claims



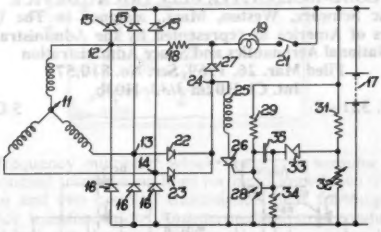
Method and means for detecting the end-of-charge condition of a storage battery under charge comprising periodically interrupting the charging current, maintaining the interruption for a period corresponding to the time constant of the internal resistance of chemical origin of the battery, measuring the voltage of the battery with a voltage test member, applying a resulting electrical magnitude developed by the test member to a threshold-comparator member which thereupon supplies a signal indicative of whether the electrical magnitude has reached a value determined in the comparator member by a threshold parameter on the basis of which the comparator was adjusted.

3,621,360

BATTERY-CHARGING SYSTEM FOR A ROAD VEHICLE WITH GENERATOR FIELD CONTROLLED BY A THYRISTOR

David Wiley, Walsall, and Maurice James Allport, Stourbridge, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 18, 1970, Ser. No. 12,168
Claims priority, application Great Britain, Mar. 25, 1969, 15,506/69
Int. Cl. H02j *7/16*
U.S. Cl. 320—48 2 Claims

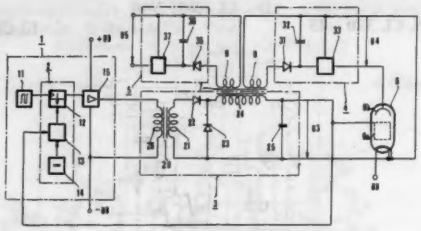


In a battery-charging system for a road vehicle there is a multiphase alternator which has a plurality of output terminals, a full-wave rectifier then connecting the output terminals to the vehicle battery but in addition there is a series circuit connecting one only of the output terminals to the vehicle battery, this series circuit including a resistor, a warning lamp and the ignition switch of the vehicle. Another set of diodes connects the other terminals of the alternator to the field winding through a thyristor, conduction of which is controlled to vary the field current, and an extra diode connects the field winding to the junction of the resistor and the warning lamp so that the warning lamp is illuminated when the ignition switch is closed until the alternator produces an output.

3,621,361
DIRECT VOLTAGE TRANSFORMER

Alfred Barth, Holzlistrasse 427, 5300 Turgi, Switzerland

Filed Oct. 19, 1970, Ser. No. 81,977
Claims priority, application Switzerland, Nov. 10, 1969, 16682/69
Int. Cl. H02m *3/22*
U.S. Cl. 321—2 **4 Claims**

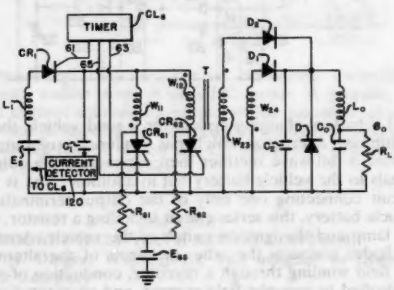


A direct voltage transformer device embodying a DC–AC inverter means at the input side thereof for delivering a square wave voltage output, said inverter means including a regulating circuit means incorporating an adjustment element for changing the pulse width of said square wave voltage output for maintaining constant the secondary direct voltage. A half-wave rectifier circuit arrangement receives the square wave voltage output of the inverter means. This half-wave rectifier circuit arrangement comprises an input transformer means constituted by a primary winding and a secondary winding, a first rectifier element electrically coupled to one terminal of said secondary winding, a subsequently coupled filter coil and capacitor filter. There is also provided a further transformer means having primary winding means and secondary winding means, wherein said primary winding means constitutes said filter coil. Additional rectifier circuit means are electrically coupled with said secondary winding means of said further transformer means, said additional rectifier circuit means conducting during the blocking periods of said first rectifier element coupled with said one terminal of said secondary winding of said input transformer. A second rectifier element is coupled between the junction point of said first rectifier element and said filter coil and the other terminal of said secondary winding of said input transformer means, this second rectifier element blocking during the conductive periods of said first rectifier element.

3,621,362
LOAD-INSENSITIVE ELECTRICAL DEVICE

Francisc Schwarz, Weston, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Mar. 26, 1969, Ser. No. 810,579
Int. Cl. H02m *3/32*; **H03b**
U.S. Cl. 321—2 **5 Claims**

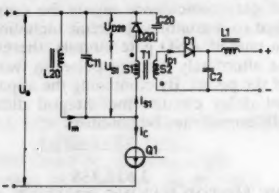


A class of power converters is disclosed for supplying direct current at one voltage from a source at another voltage which includes a simple passive circuit arrangement of solid-state switches, inductors, and capacitors by which the output voltage of the converter tends to remain constant in spite of changes in load. The switches are sensitive to the current flowing in the circuit and are employed to permit the charging of capacitance devices in accordance with the load requirements. Because solid-state switches (such as SCR's) may be used with relatively high voltage and because of the inherent efficiency of the invention that permits relatively high-switching frequencies, power supplies built in accordance with the invention, together with their associated cabling, can be substantially lighter in weight for a given output power level and efficiency of operation than systems of the prior art.

3,621,363
AN ARRANGEMENT FOR PREMAGNETIZING A STATIC DC CONVERTER

Sven N. J. Ginnman, Gottsunda 2,180 20, Akers Runo, and Per E. C. Udden, Nygatan 1,861 00, Timra, both of Sweden

Filed Oct. 14, 1969, Ser. No. 866,270
Claims priority, application Sweden, Oct. 16, 1968, 13938/68
Int. Cl. H02m *3/32*
U.S. Cl. 321—2 **4 Claims**



The invention relates to a DC converter for transforming a DC voltage to an AC voltage of high frequency and including one or several switching means to effect this operation. The invention is specifically related to the use of premagnetization means for magnetizing the transformer core in order to increase the efficiency of the converter. This is effected by premagnetizing the core into saturation with a magnetic field which is opposite to the field generated by the current through the corresponding switching means. The transformer core will consequently operate in its saturated state from the point when the switching means is rendered conductive and the current through said switching means is increasing up to a certain value above which the core will operate in its non-saturated state. This arrangement will provide a converter operating with substantially rectangular waveforms of the current supplied to the load, which means that the switching means can operate just below their maximum permissible current when energy is transferred from the current source to the load. The switching means will thus be utilized at a maximum thereby improving the efficiency of the converter.

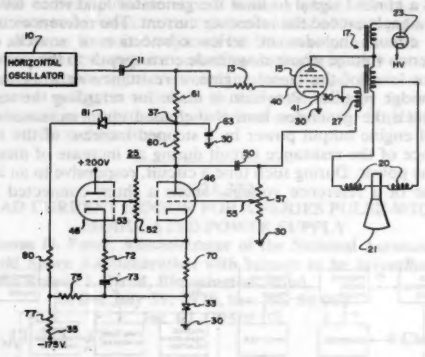
3,621,364
FAULTY ELECTRICAL COMPONENT SENSING AND PROTECTION APPARATUS

Frederick E. Worster, Highland Park, Ill., assignor to Warwick Electronics Inc.

Filed Sept. 23, 1970, Ser. No. 74,667
Int. Cl. H02m *1/18*
U.S. Cl. 321—11 **6 Claims**

A diode is coupled in series with the high-voltage regulator of a television receiver and is normally forward biased by the current therethrough. A disabling bias potential source is coupled across the diode to reverse bias the same when the regulator current disappears due to the failure or removal of

the regulator. The diode is further coupled to the horizontal-scan system such that when the disabling bias appears across



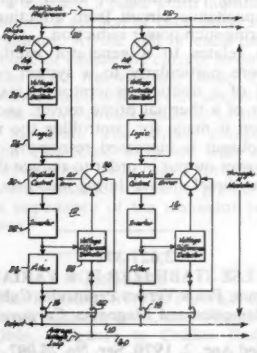
the diode due to regulator failure or removal, the scan system will be disabled by the disabling bias potential.

3,621,365

PARALLEL COUPLED STATIC INVERTERS

William H. Beck, Palos Verdes Peninsula, and Daniel W. Trimble, La Habra, both of Calif., assignors to The Garrett Corporation

Filed Aug. 13, 1970, Ser. No. 63,489
Int. Cl. H02m *7/00*
U.S. Cl. 321—27 R **11 Claims**



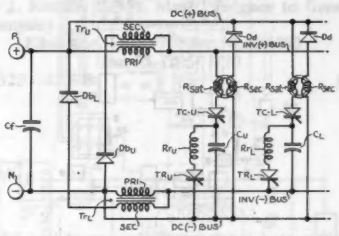
An alternating current power-supply system is disclosed in which plural static inverter modules are coupled in parallel to share a common load. Each inverter module is held in phase synchronization with a common phase reference by circuitry which generates a signal within inverter logic of the module and compares the phase of the generated signal with that of the common phase reference so as to vary the frequency of the generated signal until phase lock is achieved. The output amplitude of each inverter module is normally regulated by circuitry which compares inverter output voltage with a common amplitude reference and makes appropriate adjustments within the inverter based on the comparison so as to render the output voltage equal to the common amplitude reference. Additional amplitude regulation is provided by circuitry which determines the average of the various inverter module output voltages and corrects any inverter module having an output voltage which differs from the determined average.

3,621,366

DC SIDE COMMUTATED CHOPPER AND INVERTER

David L. Duff, Burlington, Ontario, and Shashi B. Dewan, Toronto, Ontario, both of Canada, assignors to Marathon Electric Research of Canada, Ltd., Oakville, Ontario, Canada

Filed Nov. 13, 1969, Ser. No. 876,320
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 C **2 Claims**



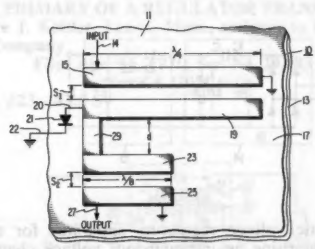
In a chopper or inverter having power thyristors that are switched on a control energization of a load from a DC source, and having commutating capacitors to which current is diverted from the power thyristors when they are to be switched off, recycling means are provided for recharging each commutating capacitor to bring it back to its original potential after each commutation and prepare it for the next commutation. Such recycling means comprises a thyristor (or a diode) and a reactor, in series, shunted across the capacitor. Several expedients are disclosed for preventing excessive charging of the commutating capacitor.

3,621,367

FREQUENCY MULTIPLIER EMPLOYING INPUT AND OUTPUT STRIP TRANSMISSION LINES WITHOUT SPATIALLY COUPLING THEREBETWEEN

Arye Rosen, Elkins Park, Pa., and Edward Mykietyn, West Windsor Township, Mercer County, N.J., assignors to RCA Corporation

Filed Nov. 26, 1969, Ser. No. 880,279
Int. Cl. H02m *5/20;* **H03h** *7/02*
U.S. Cl. 321—69 W **6 Claims**



A frequency multiplier which features a varactor diode, two coupled transmission lines for input impedance transformation and two coupled transmission lines for output impedance transformation. An intermediate strip conductor is placed between the respective coupled transmission lines so as to provide nonspatially coupling between the lines.

3,621,368

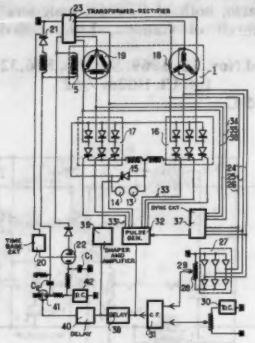
APPARATUS FOR OBTAINING AN ELECTRIC DISCHARGE IN A CONDUCTIVE LIQUID MEDIUM, MORE PARTICULARLY FOR ELECTRIC SEA FISHING

Andre Jules, Sartrouville, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Mar. 5, 1970, Ser. No. 16,884
Claims priority, application France, Mar. 6, 1969, 6906149
Int. Cl. H02p *13/16;* **H02k** *3/00;* **H02m** *7/08*
U.S. Cl. 322—18 **7 Claims**

Apparatus for obtaining an electrical discharge in a conducting liquid medium, particularly for electrical sea fishing.

A rotating pulse generator connected to the drive shaft of a



vessel is connected to electrodes immersed in a liquid by a double star and delta connected rectifying device.

3,621,369

AUTOMATIC VOLTAGE REGULATING APPARATUS FOR AC GENERATOR WITH ANTIHUNT MEANS

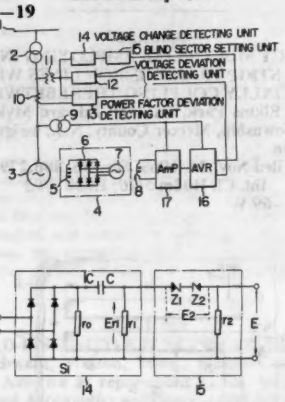
Masaomi Nagae, and Sumio Yokokawa, both of Kawasaki-shi, Japan, assignors to Fuji Denki Suzo Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

Filed Jan. 2, 1970, Ser. No. 224

Claims priority, application Japan, Jan. 9, 1969, 44/1844

Int. Cl. H02p *9/14*

U.S. Cl. 322—19 **2 Claims**



An automatic voltage regulating apparatus for an AC generator, comprising an instantaneous voltage change detecting means with a blind sector which acts to impart its output to the automatic voltage regulator only when the instantaneous voltage change thereof exceeds a predetermined value, provided in parallel with a voltage deviation detecting loop in an automatic voltage regulator for said generator, whereby when the instantaneous voltage change of the generator becomes more than a predetermined value, a transient response characteristic of said voltage regulator is caused to increase only for a predetermined period in response to said voltage change.

3,621,370

GENERATOR LOAD CONTROL SYSTEM

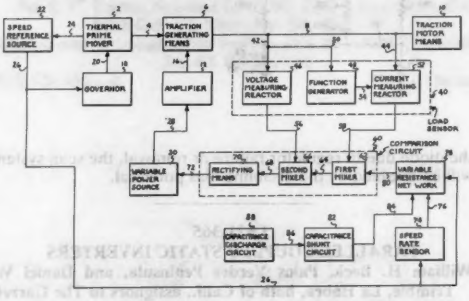
Thomas L. Vandervort, Erie, Pa., assignor to General Electric Company

Filed Aug. 18, 1969, Ser. No. 850,848

Int. Cl. H02p *9/00*

U.S. Cl. 322—23 **14 Claims**

A control system for regulating the power output of a traction generator in response to the power capability of the diesel engine prime mover wherein feedback signals responsive to the generator output current and voltage are applied to the inputs of bridge rectifiers whose outputs are serially connected in a reference current circuit. A unidirectionally conducting circuit coupled across the bridge rectifiers provides a control signal to limit the generator load when feedback signals exceed the reference current. The reference current circuit includes in series connection a source of reference voltage whose magnitude corresponds to the power output level of the diesel engine, a resistance network and the bridge rectifier. Provision is made for retarding the rate at which the generator load is increased upon increases of diesel engine output power by a stepped increase of the resistance of the resistance circuit during an increase of diesel engine power. During such time a circuit, responsive to an increase of a reference voltage, opens a shunt connected in



parallel with a portion of the resistance circuit. A capacitance connected serially across the load voltage source and a portion of the resistance network additionally shunt a portion of the reference current to prevent a stepped increase of reference current. A capacitance discharge circuit is operative during reductions of diesel engine power to prevent the capacitance circuit from affecting the rate of load control during such power reduction.

This invention relates to a generator excitation control system and more particularly to a system regulating the power demand of a traction generator in response to the available power of a thermal prime mover, such as a diesel engine. Provision is made for controlling the rate at which the generator output is increased responsive to increasing diesel engine power output in order to reduce the generation of smoke by the diesel engine during increases of diesel engine power.

3,621,371

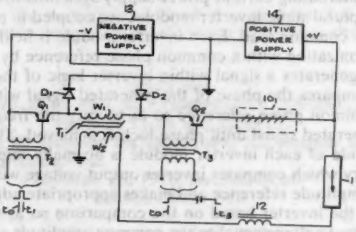
CURRENT PULSE STABILIZER FOR VARIABLE LOADS

Wayne R. Brumm, Palos Verdes Peninsula, Calif., assignor to Electronic Memories and Magnetics Corporation, Los Angeles, Calif.

Filed Apr. 2, 1970, Ser. No. 25,007

Int. Cl. G05f *3/08*

U.S. Cl. 323—17 **12 Claims**



Amplitude of a fast-rise pulse current is stabilized under varying load conditions by a transformer having a first winding connected in series between a pulse voltage source and a

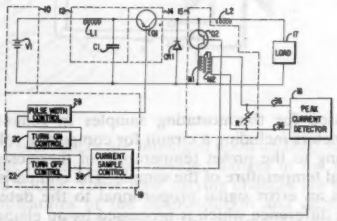
variable load. A square loop hysteresis core of the transformer is biased with regulated DC current in a second winding through a choke coil which stores energy while the bias field is being overcome by a voltage pulse, and restores energy to a power supply for the current pulse source at the end of the current pulse. In a core memory plane, the bias current source services current pulse sources of both polarities for all drive lines and adjacent bit lines are paired with current sources of opposite polarities during read and write cycles to provide tight controlled current loops. Positive and negative energy is returned to the power supply from the choke coil in a substantially balanced manner for both bit (y) and word (x) drive lines.

3,621,372

LOAD CURRENT SENSOR FOR A SERIES PULSE-WIDTH MODULATED POWER SUPPLY

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Roland L. Hron, Bloomington, Minn.

Filed July 31, 1970, Ser. No. 59,969
Int. Cl. G05f *1/56*
U.S. Cl. 323—17 4 Claims



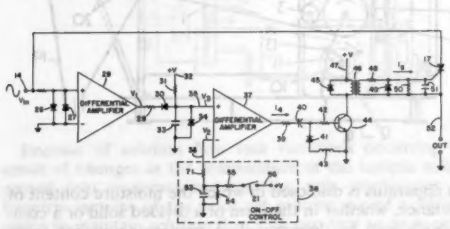
A load current sensor for use with a pulse width modulated power source and has an output filter inductor connected in series between a load and a pulse width modulated regulator. This inductor stores a portion of each pulse supplied to the load by the regulator. At the end of each pulse the stored energy in the inductor causes the current to continue flowing through the load via a freewheeling diode. This current is sampled by a sensor which is connected across the freewheeling diode and the series circuit made up of the output filter inductor and the load. The sensor comprises a gated transistor switch connected in series with a pulse transformer. The freewheeling diode has a forward conductance threshold (forward resistance) which is greater in magnitude than the series impedance of the transistor switch and the pulse transformer.

3,621,373

TRANSIENT-FREE SOLID-STATE POWER CONTACTOR

Daniel M. Mitchell, Marion, Iowa, and Chandrakant Mehta, Kettering, Ohio, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Nov. 23, 1970, Ser. No. 91,725
Int. Cl. G05f *3/00*
U.S. Cl. 323—18 12 Claims



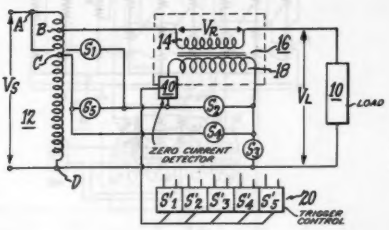
A solid-state alternating current power contactor employs silicon controlled rectifier switching elements to attain a ramp turn on by gradually increasing the rectifier conduction angle. Turnoff is effected during zero crossover. Thus transient problems associated with steplike turn on and high current turnoff are obviated.

3,621,374

VOLTAGE REGULATOR WITH ZERO CURRENT STATIC SWITCHING BETWEEN TAPS FOR A REGULATOR TRANSFORMER

Clarence J. Kettler, Lenox, Mass., assignor to General Electric Company

Filed Apr. 16, 1970, Ser. No. 29,082
Int. Cl. G05f *1/30*
U.S. Cl. 323—43.5 S 16 Claims



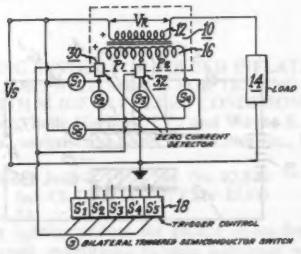
An autotransformer is connected to an unregulated voltage source, and serves as a supply transformer for a load. Interposed between this supply transformer and the load is the secondary winding of a regulating transformer, whose primary winding may be selectively coupled between various taps on the supply autotransformer winding. The primary winding of the regulating transformer is coupled to the desired points on the autotransformer winding by means of semiconductor switches, actuated when the system current waveform approaches zero.

3,621,375

VOLTAGE REGULATOR WITH ZERO CURRENT STATIC SWITCHING BETWEEN TAPPED PORTIONS OF THE PRIMARY OF A REGULATOR TRANSFORMER

Clarence J. Kettler, Lenox, Mass., assignor to General Electric Company

Filed Apr. 16, 1970, Ser. No. 29,083
Int. Cl. G05f *1/30*
U.S. Cl. 323—43.5 S 8 Claims



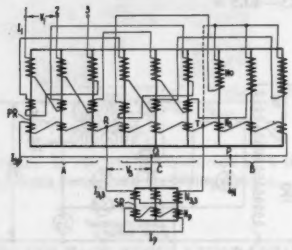
The secondary winding of a transformer is series connected between a source of unregulated voltage and a load. Gated bilateral semiconductor switches are selectively triggered to connect segments of the primary winding of the transformer across the unregulated voltage source such that incremental voltages having either bucking or boosting polarities appear across the secondary winding. A further gated bilateral semiconductor switch is provided for shorting each segment should neither bucking nor boosting voltage be required.

3,621,376

A POLYPHASE NETWORK VOLTAGE-STABILIZING ARRANGEMENT UTILIZING SATURATED REACTORS

Erich S. Friedlander, Sutton Coldfield, and Charles P. Fletcher, Birmingham, both of England, assignors to The General Electric Company Limited, London, England

Filed Apr. 27, 1970, Ser. No. 32,104
Claims priority, application Great Britain, Apr. 28, 1969, 21,810/68
Int. Cl. G05f 3/06
U.S. Cl. 323—50 17 Claims



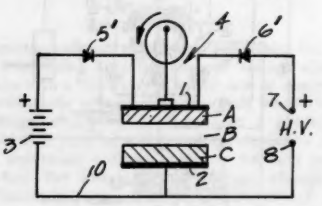
A voltage-stabilizing arrangement for three-phase alternating current networks which makes use of multicore or multilimb saturated reactors, incorporating structure for suppressing self-generated harmonics, has a group of primary alternating current saturated reactor cores provided with windings connected in shunt with the network and wound as for magnetic frequency multiplication, and compensating turns interconnected to form a closed polyphase mesh. Preferably a secondary three-phase saturated compensating treble frequency reactor has a primary winding connected in star to symmetrical treble-frequency tapping points on the closed mesh, and a secondary winding connected to form a closed short-circuited mesh.

3,621,377

METHOD AND DEVICE FOR INCREASING THE VOLTAGE OF DC ELECTRICITY

James Lim, 801 McKinley Ave., Oakland, Calif.

Filed Nov. 28, 1969, Ser. No. 880,621
Int. Cl. G05f 1/50
U.S. Cl. 323—93 6 Claims



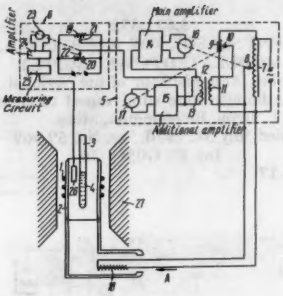
A pair of opposed spaced electrodes and dielectric medium between the electrodes, and means for changing the dielectric constant of the dielectric medium so as to vary the electrical capacitance of the electrodes with the changing of the dielectric constant. The electrodes are charged when the dielectric constant of the dielectric medium is high and discharged when the dielectric constant of the dielectric medium is low. The discharge voltage is increased by a factor proportional to the ratio of the capacitance during charging and the capacitance during discharging.

3,621,378

SAMPLE-THERMOSTATTING DEVICE FOR RADIO-FREQUENCY SPECTROMETERS NOTABLY NMR SPECTROMETERS

Jury Lvovich Kleiman, ul. Fontanka, 126, kv. 25; Nikolai Viktorovich Morkovin, Kiasnoputilovs Kaya, ul. 53, kv. 43, and Nikolai Ilich Kornilov, Nevsky prospekt, 160, kv. 16, all of, Leningrad, U.S.S.R.

Filed Apr. 25, 1969, Ser. No. 819,320
Claims priority, application U.S.S.R., May 13, 1968, 1239324
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 2 Claims



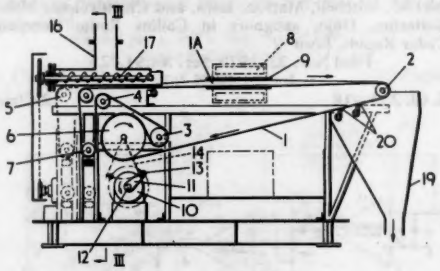
A device for thermostating samples in radio-frequency spectrometers including a circuit for comparing voltages corresponding to the preset temperature of thermostatting and the actual temperature of the sample. The comparison circuit produces an error signal proportional to the detected temperature difference which is processed by an electronic controller including a follow-up loop. The follow-up loop is provided with a potentiometer, an amplifier and a motor so interconnected that high accuracy is ensured in controlling the temperature of sample being thermostatted.

3,621,379

INTERMITTENTLY MOVING CONVEYOR APPARATUS FOR DETERMINING THE MOISTURE CONTENT OF SUBSTANCES THEREON

Edward Watson, South Hayling; Dennis M. Wilkins, Purley, and Ronald L. Johnson, New Malden, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed May 7, 1969, Ser. No. 822,605
Claims priority, application Great Britain, May 8, 1968, 21,802/68
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 5 Claims



An apparatus is disclosed in which the moisture content of a substance, whether in the form of a divided solid or a compact body, can be determined. A nuclear resonance spectrometer is used to determine the moisture content and a drive mechanism feeds a conveyor carrying the substance through the spectrometer intermittently. The conveyor is made of a water nonabsorbing material having a low

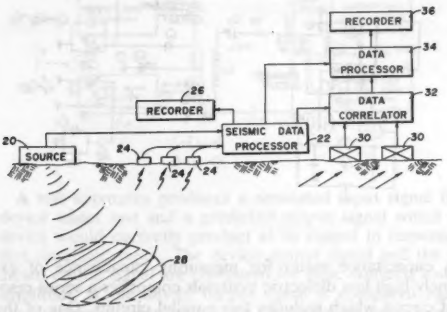
hydrogen content. The conveyor is subject to a scraping and drying action after the discharge of substance from the conveyor.

3,621,380

METHOD AND APPARATUS FOR SEISMIC-MAGNETIC PROSPECTING

Carl A. Barlow, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 2, 1969, Ser. No. 788,409
Int. Cl. G01v *3/00, 11/00*
U.S. Cl. 324—1 **9 Claims**



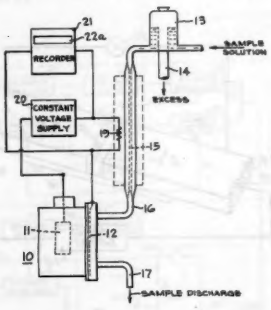
Seismic disturbances are impinged upon underground magnetic bodies to cause time varying changes in the magnetic field of the bodies. These time varying changes are sensed to provide indications of the magnetization and depth of the bodies. Seismic reflections from the seismic disturbances are also sensed and recorded, with the time varying changes processed in conjunction with the seismic reflections to eliminate noise and otherwise enhance the magnetic data.

3,621,381

COULOMETRIC SYSTEM HAVING COMPENSATION FOR TEMPERATURE INDUCED VISCOSITY CHANGES

Edgar L. Eckfeldt, Ambler, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Oct. 16, 1968, Ser. No. 797,715
Int. Cl. G01n *27/42;* **G01r** *27/02*
U.S. Cl. 324—30 B **9 Claims**



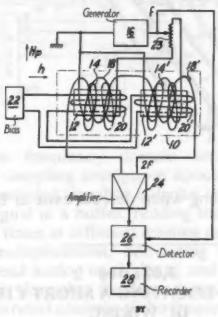
Because of solution flow rate variations occurring as a result of changes in the temperature of the sample solution passed into coulometric measuring cells, continuous coulometric systems of the prior art require use of a metering pump to maintain solution flow rate constant so as to permit accurate solution constituent concentration measurements. The invention permits accurate, continuous concentration measurements to be made coulometrically, independent of any flow rate variations caused by sample solution temperature changes. This is achieved through the use of a device (such as, for example, a thermistor) responsive to the coulometric current, which device develops an output varying with the changes in the concentration of the constituent to be measured and invariant with changes in the flow impedance of the sample solution caused by changes in its temperature.

3,621,382

ANISTROPIC THIN FERROMAGNETIC FILM MAGNETOMETER

Jean-Yves Valet, 5 Rue General Mignot, 38 Seyssinet, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 7, 1969, Ser. No. 864,307
Claims priority, application France, Oct. 10, 1968, 169,489
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 **13 Claims**



A thin bistable ferromagnetic film of the inverted type (i.e. for which the coercive forces H_r and H_{rt} are smaller than the anisotropy field H_k) is used as sensor and is associated with a pumping coil which submits the film to an alternating field (frequency f) along the easy axis and with a detection coil wound around the easy axis. A steady biasing field is applied along the hard axis, at least if the thin film is a flat strip. The value of the field component along the easy axis is deduced from the time difference between successive reversals of the magnetic vector in the strip from the amplitude of the harmonic $2f$ of the signal in the detection coil.

The magnetometer makes it possible to detect fields as low as 0.1 γ since reversal of the magnetic vector in the film is made without wall movement and consequently without Barkhausen noises.

3,621,383

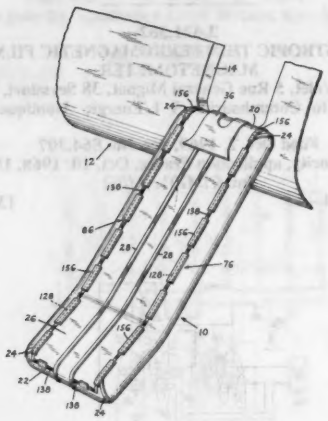
LIGHTING SYSTEM FOR FOLDED INFLATABLE ESCAPE SLIDES WITH MEANS FOR TESTING SYSTEM WITH SLIDE IN FOLDED CONDITION

David H. Rush, Belle Harbor, N.Y., and Wayne E. Williams, Miami, Fla., assignors to Eastern Air Lines Inc., New York, N.Y.

Filed June 2, 1970, Ser. No. 42,840
Int. Cl. G01r *31/02;* **F21v** *33/00*
U.S. Cl. 324—51 **1 Claim**

Emergency lighting system for escape slides for vehicles, primarily aircraft, comprising lighting harnesses with a plurality of electric lighting units, a battery pack, switch mechanism automatically operated to energize lights upon deployment of slide, the lighting harnesses being prefabricated in one standard size adaptable for application to slides of widely varying sizes and configurations and a testing device for determining operative condition of switch, lights and batteries without deploying slide. Slide is normally carried in aircraft in tightly folded condition with battery pack and lighting units inaccessible. Testing device includes jack extended to accessible position and testing instrument with cooperating plug. Instrument may be carried to any

folded slide on an aircraft or a fleet of aircraft for periodic checking. Instrument indicates by deviation from a predeter-



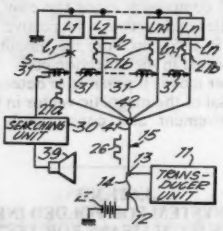
mined standard reading when defects exist in batteries, wiring, bulbs or switch.

3,621,384

APPARATUS FOR LOCATING A SHORT CIRCUIT IN A DC WIRING

Kazuo Yamada, 14-20 Nichome, Benten, Minato-ku, Osaka, Japan

Filed July 16, 1969, Ser. No. 842,221
Claims priority, application Japan, July 19, 1968, 43/51478
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **3 Claims**



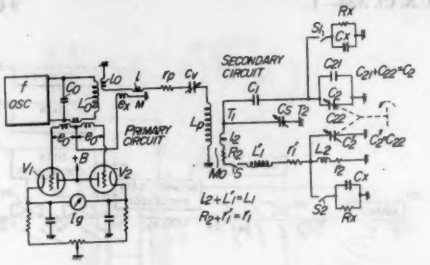
Apparatus for locating a short circuit in the wiring of a DC circuit having current-intermitting means connected in parallel with a power supply fuse of the circuit for intermittently conducting a current from a power source of the circuit to the wiring when the fuse is blown. A searching unit includes a search coil for detecting an alternating field formed around a portion of the wiring through which the intermitting current flows. The current-intermitting means includes a voltage detector for generating output signals when the voltage applied to the opposite terminals of the current-intermitting means due to blowing of the fuse reaches such a high voltage as applied if any point of the wiring is short circuited. The current-intermitting means also includes means for supplying periodic pulses into the wiring by intermittently connecting the power source to the wiring when the means for supplying periodic pulses receives actuate signals from the preselected voltage detector.

3,621,385

METER FOR MEASURING CAPACITANCES OF EXTREMELY HIGH LOSS DIELECTRIC MATERIALS

Bunjiro Ichijo, Hamamatsu-shi, Japan, assignor to Kett Electric Laboratory, Tokyo, Japan

Filed Nov. 14, 1969, Ser. No. 876,797
Claims priority, application Japan, Nov. 18, 1968, 43/84356
Int. Cl. G01n *11/52*
U.S. Cl. 324—60 R **1 Claim**



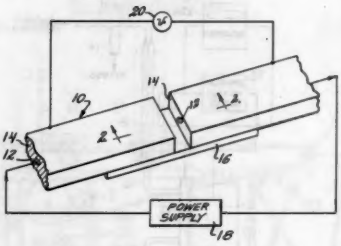
A capacitance meter for measuring capacitance of extremely high loss dielectric materials comprises a series resonant circuit which includes two parallel circuits. One of the parallel circuits comprises a fixed capacitor, a first portion of a variable gang capacitor, and a first test sample; and the other parallel circuit comprises an inductance, a second portion of the variable gang capacitor, and a second test sample identical to the first sample. An accurate measurement of the capacitance of the material in the samples, irrespective of values of resistance components thereof, is effected through a substitution method by adjusting the variable gang capacitor.

3,621,386

METHOD OF DETERMINING BONDING IN A COMPOSITE SUPERCONDUCTOR

John R. Purcell, Downers Grove, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 16, 1969, Ser. No. 885,576
Int. Cl. G01r *27/14*
U.S. Cl. 324—64 **6 Claims**



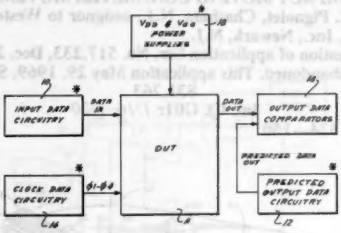
Bond quality between a superconductor and a coating thereabout of normal material having high electrical conductivity at superconducting temperatures is measured by interrupting the electrical continuity of the superconductor and cooling the superconductor and coating to a temperature to cause the superconductor to assume a superconducting state. A current of known value is applied to the superconductor and the voltage drop along the coating on both sides of the electrical discontinuity is measured to provide a measure of bond quality.

3,621,387

COMPUTER-CONTROLLED TESTER FOR INTEGRATED CIRCUIT DEVICES

Kent F. Smith, and Kay D. Smith, both of Salt Lake City, Utah, assignors to General Instrument Corporation, Newark, N.J.

Filed Aug. 21, 1969, Ser. No. 851,903
Int. Cl. G01r 31/00
U.S. Cl. 324—73 R 19 Claims



A test apparatus produces a simulated input signal for a device under test and a predicted output signal which that device would correctly product at its output in response to that simulated input. The device output signal and the predicted output signal are compared for logic content, and the amplitude of the device output signal is compared against predetermined reference levels. A separate error signal is produced upon the occurrence of an error in either of these properties in the device output signal.

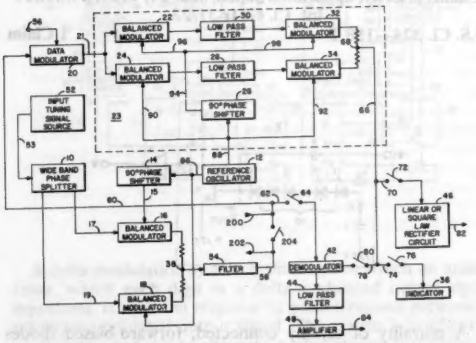
The input and predicted output signals are initially stored into the apparatus from an external computer which also establishes the appropriate clock signals and power supply signals for the device under test. In the embodiment herein shown, the input and output data is preloaded in shift registers and means are provided to sequentially transfer the simulated input and predicted output signals in a time controlled manner from these shift registers to the device and to the output signal comparator.

3,621,388

ELECTRONIC WAVE ANALYZER FOR DETERMINING THE FREQUENCY AND AMPLITUDE OF COMPONENTS IN A COMPLEX WAVEFORM

Robert D. Davis, Spring Valley, Calif., assignor to Spectral Dynamics Corporation, San Diego, Calif.

Filed Nov. 4, 1968, Ser. No. 773,156
Int. Cl. G01r 23/16
U.S. Cl. 324—77 15 Claims



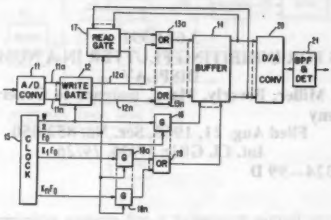
A wave analyzer capable of determining the amplitudes and phases of frequency components in a complex waveform. he selection of a frequency component is determined by the frequency of an external "tuning" signal source. The selectivity or ability to resolve frequency components close to each other is controlled by a manual or automatic bandwidth switching circuit or a voltage controlled continuously variable bandwidth circuit.

3,621,389

FREQUENCY DOMAIN ANALYZER USING VARIABLE-RATE TIME COMPRESSION

Jack T. Murray, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1969, Ser. No. 837,292
Int. Cl. G01r 23/16
U.S. Cl. 324—77 R 2 Claims



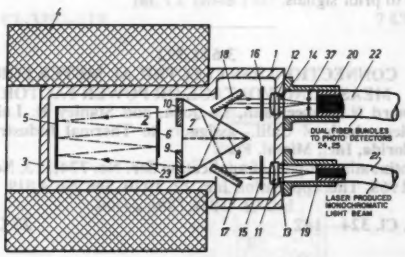
Contiguous frequency domain analysis of signals is achieved by sampling contiguous epochs of the signal; converting the sampled signal to a digital representation; storing the digital signal in a buffer; reading the stored digital signal a number of times at different reading rates to effect multiple frequency multiplications; converting the different digital signals red read analog equivalents; and passing the different analog signals through a fixed band-pass filter detector to effect an accelerated analysis of the frequency shifted signal.

3,621,390

ARRANGEMENT FOR MEASURING A TIME VARIABLE MAGNETIC FIELD USING THE FARADAY EFFECT

Friedrick K. Von Willisen, Zurich, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Apr. 22, 1969, Ser. No. 818,290
Claims priority, application Switzerland, Apr. 23, 1968, 60005/68
Int. Cl. G01r 31/00
U.S. Cl. 324—96 6 Claims



An arrangement for measuring a time-variable magnetic field in order to measure, for example, the current flowing in a high-voltage line, utilizes a measuring head subjected to a magnetic field proportional to the line current which encloses a magneto-optical element in the form of a Faraday cell that functions in conjunction with an optical divider in the form of a Koesters prism to form a two-beam interferometer. A laser produced monochromatic light beam fed to the measuring head over an optical fiber bundle passes through a polarizing filter onto the divider plane of the Koesters prism where it is split into two partial beams. One beam passes through a first quarter-wave plate in which it is circularly polarized in a dextrorotary sense, thence through

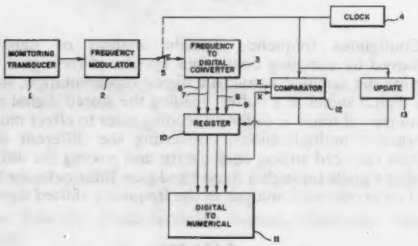
the Faraday cell where it undergoes multiple reflection in the magnetic field and thence through a second quarter-wave plate back to the divider plane of the Koesters prism. The other beam passes through the same path but in the opposite direction, passing first through the second quarter-wave plate where it is polarized in a levorotary sense, and ultimately arriving back at the divider plane. The two returning beams combine in the divider plane of the Koesters prism to form an outgoing beam consisting of two 90° phase-displaced components modulated in intensity as a function of the variation in the magnetic field. The two phase-shifted beam components are passed respectively through optical fiber bundles to a processing circuit where they are converted into correspondingly modulated electrical signal components which are then demodulated to a final output electrical signal constituting a measure of the current in the high-voltage line.

3,621,391

MEANS FOR INHIBITING FLUTTER IN A NUMERICAL DISPLAY

David E. Miller, Beverly, Mass., assignor to General Electric Company

Filed Aug. 21, 1969, Ser. No. 852,050
Int. Cl. G01r *17/06, 19/26*
U.S. Cl. 324—99 D **6 Claims**



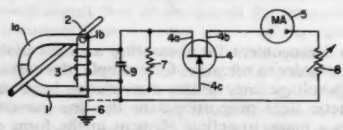
Rapid oscillation between consecutive numbers displayed by a numerical display device is prevented by comparing an incoming digitally coded signal with one representing the numeral currently registered by the device. If the incoming signal corresponds to a numeral consecutive to the one being displayed, the system inhibits the registration of the new signal by the device. At predetermined intervals the comparison system is bypassed and the device is "updated" by allowing registration of new signals, regardless of their relationship to prior signals.

3,621,392

CONNECTIONLESS ELECTRICAL METER FOR MEASURING VOLTAGE OR POWER FACTOR

Leonard N. Liebermann, La Jolla, and Stanley H. Lai, San Diego, both of Calif., assignors to Thermal Industries of Florida, Inc., Miami, Fla.

Continuation-in-part of application Ser. No. 774,113, Nov. 7, 1968. This application Jan. 22, 1970, Ser. No. 4,819
Int. Cl. G01r *7/00, 21/00*
U.S. Cl. 324—142 **22 Claims**



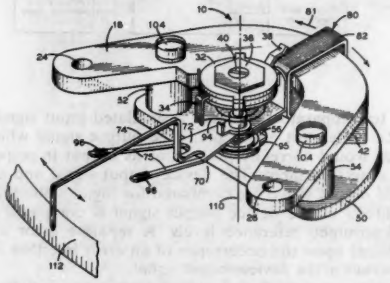
A connectionless electrical meter is described which is capable of measuring the power carried by a conductor at a voltage with respect to ground, or the power factor thereof, without the necessity for any ohmic connection between the meter and the circuit being measured. Conductor current is measured by magnetic induction with an openable transformer core which surrounds the conductor. A signal in-phase with the voltage is obtained by electrostatic induction. In certain embodiments of the invention, a unique voltage probe is used for obtaining a signal proportional to the conductor voltage. Apparatus described herein employing such voltage probe is additionally useful for measurement of voltage independently of power or power factor.

3,621,393

COMPACT MOVING COIL METER MOVEMENT

Louis W. Pignolet, Chatham, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Continuation of application Ser. No. 517,233, Dec. 29, 1965, now abandoned. This application May 29, 1969, Ser. No. 831,263
Int. Cl. G01r *1/16, 1/20*
U.S. Cl. 324—150 **3 Claims**



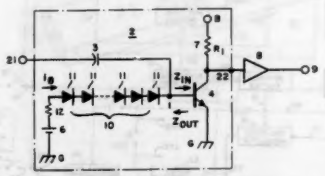
Meter movement having a single U-shaped plate with an arcuate permanent magnet secured to one surface thereof. An inward extension of the plate forms one pivotal support for a moving coil and pointer assembly. The coil surrounds the magnet and the portion of the plate adjacent the magnet and is freely movable transversely of the magnet as the moving coil assembly rotates. The second pivotal support and the remainder of the magnetic circuit is provided by a second plate which is mounted in parallel spaced relationship to the first plate, the magnet being between the two plates. The second plate is spaced from the magnet to allow clearance for one leg of the coil.

3,621,394

TRANSISTOR NOISE MEASURING CIRCUIT

Knud Knudsen, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 9, 1970, Ser. No. 1,582
Claims priority, application Japan, Jan. 24, 1969, 44/04814
Int. Cl. G01r *31/22*
U.S. Cl. 324—158 T **1 Claim**

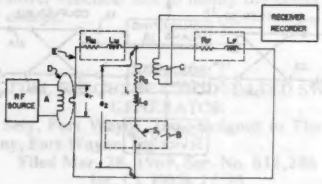


A plurality of serially connected, forward-biased diodes and a resistor supply base current from a voltage supply to a transistor under test. Bias circuit impedance is thus maintained high so that the transistor's output noise is primarily due to the transistor's equivalent input current noise and not to the transistor's equivalent input voltage noise nor to the noise generated in the bias network.

3,621,395
A METHOD AND APPARATUS FOR DETERMINING THE CUTTING TIME OF A MACHINE TOOL

Harold L. Brown, 109 Westline Road, Azle, Tex., and LeRoy M. Vaught, Rte. 1, Box 529J, Burleson, Tex.

Continuation-in-part of application Ser. No. 594,806, Nov. 16, 1966, now abandoned. This application July 22, 1969, Ser. No. 843,627
Int. Cl. G04f *9/00*
U.S. Cl. 324—181 **7 Claims**

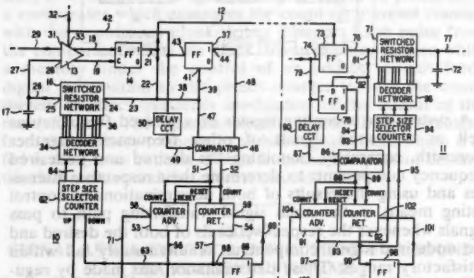


Means for accurately determining actual cutting time of a machine tool through inducing a radiofrequency voltage directly into the machine frame, then detecting amplitude modulation of the current flowing in the machine which amplitude modulations result from rapid and continuous current changes caused by the make and break of the cutter blades and the workpiece. These amplitude-modulated radiofrequency signals are converted to pulses which are used to actuate a timing or recording means.

3,621,396
DELTA MODULATION INFORMATION TRANSMISSION SYSTEM

Thomas Henry Daugherty, Oakhurst, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.

Filed May 8, 1970, Ser. No. 035,761
Int. Cl. Ho4b *1/00*
U.S. Cl. 325—38 B **6 Claims**

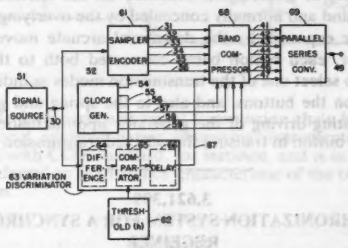


A delta-modulation system is disclosed in which an analog value, which each digit in a delta-modulated output signal represents, is varied in response to predetermined patterns of the delta-modulated output signal. The system is configured to allow the step size to alternate easily between two adjacent step sizes but imposes stricter requirements before further step-size changes are made. The easy alternation between adjacent step sizes improves system fidelity while the stricter requirements for further step-size changes have a filtering effect by preventing large changes in step size due to short bursts of noise or unwanted signal.

3,621,397
PCM TRANSMISSION SYSTEM

Masayoshi Murotani, Kanagawa; Ryoichi Tanaka, Tokyo; Keiji Tachikawa, Chiba, and Tadao Shimamura, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Nippon Electric Company, Limited, Tokyo, Japan

Filed July 22, 1969, Ser. No. 843,583
Claims priority, application Japan, July 22, 1968, 43/52062
Int. Cl. H03k *13/22*; H04b *1/66*
U.S. Cl. 325—38 **14 Claims**

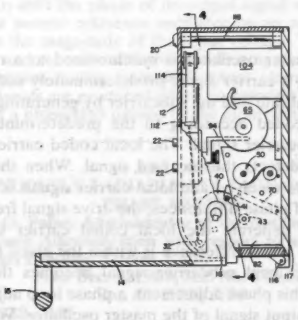


A transmission system for a television signal represented by a pulse code modulation signal compressed in bandwidth, comprising a transmitter for dividing the television signal into a preselected number of samples indicated by a corresponding number of first sets of parallel pulse code modulation pulses which are converted into a preselected number of second sets of parallel pulse code modulation pulses containing "O" and "1" logic signals to indicate slow and rapid changes in the television signal magnitude at successive even-number signal samples; the preselected second number being smaller than the preselected first number; the second parallel pulse sets being transmitted as series pulse code modulation pulses; and a receiver for converting the received series pulses into a third set of parallel pulse code modulation pulses including the "0" and "1" logic signals and corresponding to the transmitter second pulse sets, and translating the receiver third pulse sets into a reproduction of the transmitter television signal.

3,621,398
EMERGENCY TRANSMITTER POWER SUPPLY

John George Willia, Wakefield, Mass., assignor to Solid State Technology, Inc., Saugus, Mass.

Filed Oct. 30, 1969, Ser. No. 872,576
Int. Cl. H04b *1/02*
U.S. Cl. 325—119 **7 Claims**



An enclosed batteryless remote wireless electrical signalling system with a radio transmitter having a plurality of selectable transmission modes and an electromechanical generator driven by a spring mounted within the enclosure. Manually operable means are provided for selecting a predetermined one of the transmission modes and operating

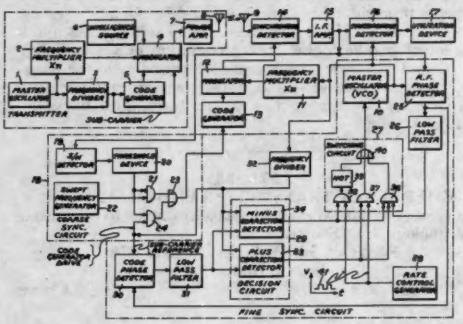
the generator to energize the transmitter means for a substantial period of time for transmission of the selected mode. Such means includes a manual winding lever overlying a portion of the front wall of the enclosure with its lower end pivoted adjacent the bottom of the front wall and with its free upper end having a handle. The lever is manually swingable downwardly and away from said front wall throughout an arcuate path of about 90° generally perpendicular to said front wall to wind the spring. The manually operable means also includes manual actuating means having a plurality of pushbuttons mounted on the enclosure front wall behind and normally concealed by the overlying winding lever for exposure by the downward arcuate movement of the lever, each button being connected both to the transmitter to select one of the transmission modes as indicated by indicia on the buttons, and also to the spring and generator for initiating driving of the generator upon actuation of the selected button to transmit the selected transmission mode.

3,621,399

SYNCHRONIZATION SYSTEM FOR A SYNCHRONOUS RECEIVER

Gerald Rabow, Nutley, N.J., and Albert M. Klein, Chatsworth, Calif., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 3, 1968, Ser. No. 764,800
Int. Cl. H04b 1/16; H03k 1/9; H04l 1/7
U.S. Cl. 325—321 **10 Claims**



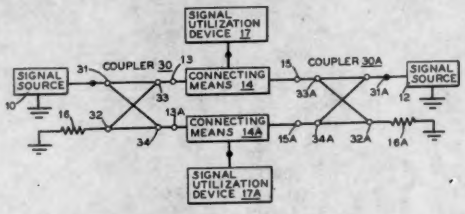
A receiver mater oscillator is synchronized to a received signal including a carrier signal predeterminately coded at a subcarrier signal rate and the subcarrier by generating a local carrier signal coded according to the predetermined code and a local subcarrier signal. The local coded carrier signal synchronously detects the received signal. When the phase difference of the received and local carrier signals is outside a given range of phase differences, the drive signal frequency cooperating to generate the local coded carrier signal is varied until the phase difference is within the given range at which time the local subcarrier signal becomes the drive signal. During this phase adjustment, a phase loop adjusts the phase of the output signal of the master oscillator. When the phase difference is with the given range, a phase detector compares the phase of the received subcarrier signal derived from the loop with the local subcarrier signal and a decision circuit coupled thereto provides an output signal for control of a switching arrangement in the loop to open the loop and apply a step voltage of proper polarity to the oscillator for achievement of the desired synchronization.

3,621,400

ALTERNATING CURRENT SIGNAL-COMBINING APPARATUS

Leonard J. Paciorek, North Syracuse, and Carl W. Gerst, Skaneateles, both of N.Y., assignors to Anaren Microwave, Incorporated, Syracuse, N.Y.

Filed Apr. 17, 1969, Ser. No. 816,986
Int. Cl. H04b 1/26
U.S. Cl. 325—446 **14 Claims**



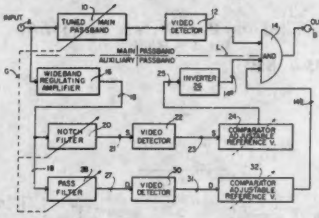
A plurality of 3 db. couplers interconnect two signal sources to a signal utilization device. By virtue of the properties of the couplers and their interconnections there is achieved good signal isolation and low voltage standing wave ratios. Several examples of signal heterodyning devices such as mixers and modulators are shown as well as linear signal-combining devices.

3,621,401

FREQUENCY SPECTRUM RESPONSIVE NOISE REDUCTION SYSTEM

Walter J. Young, Jr., Tonawanda, N.Y., assignor to Sierra Research Corporation

Filed Sept. 23, 1969, Ser. No. 860,290
Int. Cl. H04b 1/10
U.S. Cl. 325—473 **7 Claims**



A system for accepting signals of a desired frequency as well as undesired signals of other frequencies together therewith, separately examining the desired and undesired frequency components to determine their respective intensities and using the results of both determinations to control gating means in the main signal transferring path to pass signals whenever the respective levels of both the desired and the undesired signal components simultaneously fall within satisfactory ranges. These determination are made by regulating a composite of both signal components to a constant level, separating out both components, and then comparing the levels of each with preadjusted reference threshold levels to derive two simultaneous gate controlling signals.

3,621,402

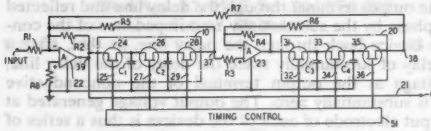
SAMPLED DATA FILTER

William Allen Gardner, Sunderland, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 3, 1970, Ser. No. 60,558
Int. Cl. H03k 23/00
U.S. Cl. 328—37 **9 Claims**

A sampled data filter is disclosed comprising a plurality of amplifiers interconnected by delay units and feedback resistors. Each delay unit comprises the cascade connection of

actuable switches and storage capacitors. The values of the capacitors and feedback resistors are preselected to obtain a



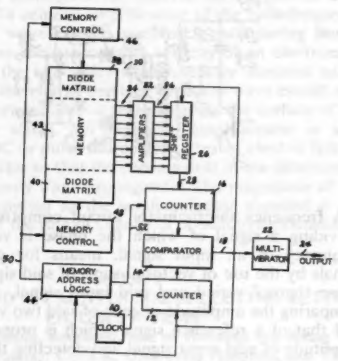
desired transfer function and to nullify the effect of residual capacitor charge.

3,621,403

DIGITAL FREQUENCY MODULATED SWEEP GENERATOR

Merle E. Seiy, Fort Wayne, Ind., assignor to The Magnovox Company, Fort Wayne, Ind.

Filed Mar. 28, 1969, Ser. No. 811,286
Int. Cl. H03k *21/36*
U.S. Cl. 328—61 **14 Claims**



The invention relates to a frequency modulated sweep generator in which a bistable multivibrator supplies a pulse train at its output. The multivibrator is driven by pulses from a comparator which compares the count on a preset counter with the count on a clock driven counter. Each pulse from the comparator resets the clock driven counter to zero while a memory under the control of an address circuit feeds digital information to the preset counter to vary the count therein to effect frequency modulation of the output of the multivibrator. The address circuit causes the information from the memory to move to a shift register from which it is fed to the preset counter. Pulses from the comparator control the shift register and the address circuit.

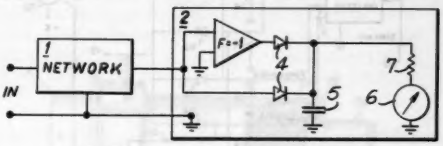
3,621,404

SIGNAL LEVEL CONTROL INSTRUMENT FOR SOUND TRANSMISSION SYSTEMS

Sven Hakan Sjogren, Civilingenjar Hakan Sjogren 23, Dolvagen 183, 40, Taby, Swden

Filed Sept. 19, 1968, Ser. No. 760,953
Claims priority, application Sweden, Sept. 20, 1967, 12940/67
Int. Cl. G01r *23/16*
U.S. Cl. 328—162 **1 Claim**

This disclosure relates to signal level control instruments for sound transmission systems comprising a signal top value measuring instrument for indicating a maximal reference volume for a high quality sound signal transmission in the system without exceeding a desired maximum distortion of the signal and, in particular, transient signals of short duration. The invention teaches the use in combination with a signal top value measuring instrument of a weighing network inserted between the top value measuring instrument and the transmission chain, the output signal of which is to be measured, said weighing network having an attenuation function being essentially an image function of a function defining the maximum input signal level versus frequency for a predetermined relative intermodulation distortion. This function is



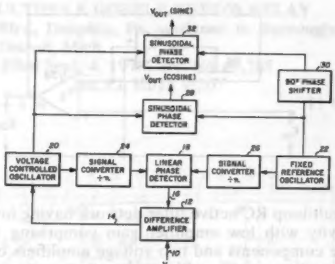
obtainable for a particular signal transmission chain by aid of conventional intermodulation measuring instruments in accordance with CCIF standard, for instance, and is in the following referred to as tolerance characteristic of the transmission chain.

3,621,405

SINUSOIDAL CONVERTER

Walter N. Carlsen, Palo Alto, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed May 28, 1968, Ser. No. 732,738
Int. Cl. G01r *19/14*
U.S. Cl. 328—133 **11 Claims**



A sinusoidal converter for converting an input voltage into a voltage whose magnitude varies as the sine or cosine of a phase shift caused by the input voltage. A first oscillator is caused to shift the phase of its output signal with relation to that of a second reference oscillator by an amount proportional to the magnitude of the input voltage. The outputs of the first and second oscillators are then applied to phase detection means having sinusoidal output characteristics, and output signals are produced which correspond to the sine and cosine of a phase shift caused by the input voltage.

3,621,406

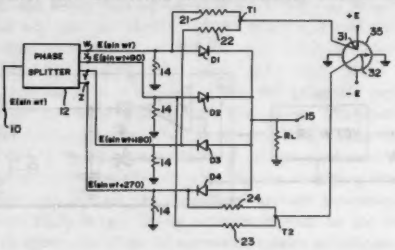
CONTINUOUSLY VARIABLE VOLTAGE-CONTROLLED PHASE SHIFTER

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Carl E. Johns, Sylmar, Calif.

Filed Dec. 9, 1969, Ser. No. 883,528
Int. Cl. H03b *3/04*
U.S. Cl. 328—155 **8 Claims**

A continuously variable phase shifter including a phase splitter which provides four quadrature signals of an input signal, a summing resistor and a phase control diode matrix between the phase splitter and the summing resistor. The matrix includes a separate diode in the path of each of said four signals. The four diodes are connected to two terminals at which DC control voltages are applied to control the states of conduction of the four diodes. The diodes are controlled

so that only one diode is fully forward biased when 0°, 90°, 180° or 270° phase shift is desired while two of the four



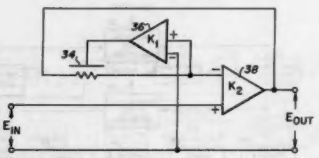
diodes are partially forward biased when a phase shift between any two of the above four values is desired.

3,621,407

MULTILOOP RC ACTIVE FILTER APPARATUS HAVING LOW-PARAMETER SENSITIVITY WITH LOW-AMPLIFIER GAIN

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; William J. Kerwin, Tucson, Ariz., and Charles V. Shaffer, Gainesville, Fla.

Filed Feb. 27, 1970, Ser. No. 15,024
Int. Cl. H03b *1/04*
U.S. Cl. 328—167 **10 Claims**



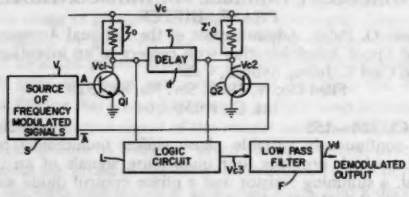
A multiloop RC active filter network having low parameter sensitivity with low amplifier gain comprising at least two passive components and two voltage amplifiers one of which has a positive gain K_1 which is less than unity and the other providing a negative gain of magnitude of K_2 in the outer feedback loop. These circuits can provide any Q and can be made to oscillate with K_1 and K_2 within certain given ranges. Monolithic integrated circuit thick or thin film techniques are used in the preferred embodiment to provide the passive RC components.

3,621,408

FM DEMODULATOR

Paul G. Kennedy, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1969, Ser. No. 873,569
Int. Cl. H03d *3/14*
U.S. Cl. 329—103 **9 Claims**



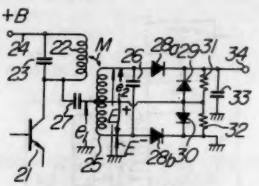
A frequency demodulator for demodulating FM signals in direct and complementary form wherein a pair of switching devices, such as transistors ro similar devices are switched to opposite conductivity states in response to the FM signals and wherein a delay line is connected between output terminals of the devices so that when one of the devices is switched to its nonconductive state a voltage is propagated from the output terminal through the delay line and reflected out of phase by the substantially zero impedance of the conductive device back through the delay line, so that, after a time delay of substantially twice the delay of the delay line, the voltage at the output terminal of the nonconductive device is substantially zero. The output voltage generated at the output electrode of each of the devices is thus a series of pulses at the frequency of the FM signals and having a constant pulse width of substantially twice the time delay of the delay line.

3,621,409

FREQUENCY DISCRIMINATOR CIRCUIT HAVING A NARROW DETECTION BAND

Kazutoshi Segawa, Ibaragi-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 27, 1969, Ser. No. 869,498
Int. Cl. H03d *3/08*
U.S. Cl. 329—110 **3 Claims**



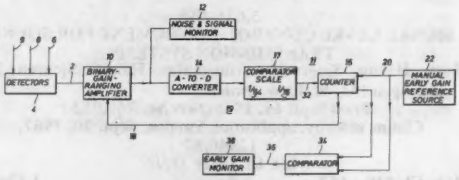
A frequency discriminator circuit comprising means for providing a signal of which the phase is varied with the frequency of an input signal, means for generating two signals by the use of vectorial sums of said signal having the phase thereof varied and said input signal, and means for comparing the amplitude of each of said two vectorial signals and that of a reference signal which is proportional to the amplitude of said input signal and detecting that one of said two signals which has a greater amplitude, wherein the demodulation and frequency detection of an FM signal having a small frequency deviation as compared with the center frequency are limited so as to be effected only in the required frequency band, thus preventing noise disturbance outside the required band from occurring in the output.

3,621,410

BINARY AMPLIFIER GAIN CONTROL

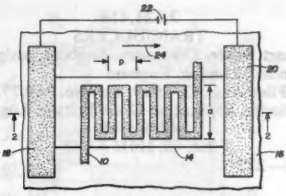
Algernon S. Badger, and Jerrell F. Moffitt, both of Houston, Tex., assignors to Geo Space Corporation

Filed Sept. 11, 1969, Ser. No. 857,088
Int. Cl. H03g *3/22*
U.S. Cl. 330—2 **6 Claims**



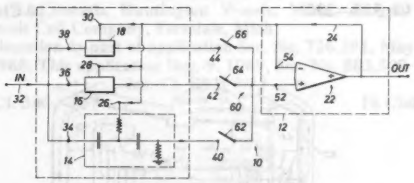
This invention relates to multichannel, seimic-data-acquisition systems and more particularly to such systems which include binary-gain-ranging amplifiers. The gain of the amplifier is allowed to range within prescribed limits. The actual grain of the amplifier is then compared with a preset early gain. The result of the comparison is displayed on a suitable monitor to alert the operator of the existence of noise or of abnormal conditions in the channel.

3,621,411
TRAVELING HIGH-GAIN AMPLIFIER
William R. Wisseman, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 13, 1969, Ser. No. 876,485
Int. Cl. H03f *3/04*
U.S. Cl. 330—5 15 Claims



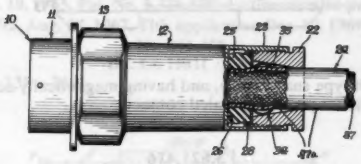
Power amplification of a radiofrequency signal is achieved in a two-valley semiconductor material such a gallium arsenide (GaAs). To achieve amplification of the radiofrequency signal, a slow wave circuit, such as a meandering line is required to slow the propagating velocity of an electromagnetic wave in the two-valley semiconductor material below the velocity of the charge carriers. The slow wave circuit may be formed by printed circuit techniques on the surface of the semiconductor wafer. For high-gain amplification or self-oscillation, a DC or pulse source generates an electric field in the semiconductor so that the carriers drift in the direction of the radiofrequency wave propagation. The magnitude of the electric field applied to the semiconductor material is adjusted such that the rate of change of conductivity vanishes.

3,621,412
METHOD AND APPARATUS FOR SELECTING ACTIVE FILTER SYSTEMS
Richard W. Keeling, deceased, late of Houston (by Katie Vee Keeling, executrix); Cecil R. Gilbreath, Houston, and Virgil O. Stamps, Houston, all of Tex., assignors to Geo Space Corporation
Filed Aug. 25, 1969, Ser. No. 870,589
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 4 Claims



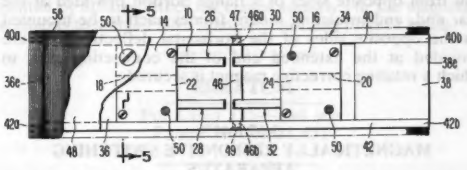
This invention relates to a method and apparatus for seismic signal processing through active filter systems adapted to transmit incoming seismic signals to a recorder in a manner as to attenuate undesired noise and frequencies outside of the band of interest. Each active filter system comprises an active network and a plurality of passive filter networks. Each passive filter network can be connected to the input circuit of the active network independently, or in parallel combination with one or more passive filter networks. Each established connection between a single passive filter network and the active network, or between a parallel combination of passive filter networks and the active network, provides a distinct cutoff frequency without deleteriously affecting the filter's frequency response.

3,621,413
STRAIN RELIEF FOR ELECTRICAL CONNECTORS
Wolfgang Hilbert, Holzkirchen, Germany, assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Jan. 19, 1970, Ser. No. 4,002
Int. Cl. H01r *13/58*
U.S. Cl. 339—103 3 Claims



Strain relief for electrical connectors in which a tubular member is moved into one end portion of a shell to force compressible means into tight engagement with a cable. The compressible means includes a C-shaped metal member of curved cross-sectional shape providing a rounded convex outer surface for wedge engagement with a frustoconical inner surface of the tubular member and further includes an annular member of elastomeric material having an internal surface forced into pressure engagement with the cable when axially compressed between one end of the tubular member and an internal shoulder of the shell.

3,621,414
MULTIPOLE DOUBLE-THROW RELAY
Joseph W. Bird, Dauphin, Pa., assignor to Burroughs Corporation, Detroit, Mich.
Filed Sept. 4, 1970, Ser. No. 69,785
Int. Cl. H01h *9/20*
U.S. Cl. 335—174 11 Claims



An electromagnetic relay whose armature moves alternately in opposite directions in response to alternate signals of the same polarity similarly applied to the same input terminals of the relay coil.

ERRATA

For Classes 331—10 and 331—111 see:
Patent Nos. 3,621,450 and 3,621,469

For Classes 332—14 and 332—47 see:
Patent Nos. 3,621,472 and 3,621,474

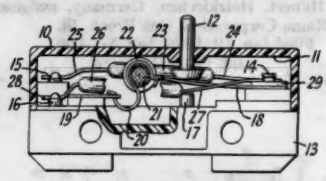
For Classes 333—1 and 333—97 R see:
Patent Nos. 3,621,475 and 3,621,486

For Class 334—11 see:
Patent No. 3,621,487

3,621,415
PRECISION REED-TYPE SNAP SWITCHES
Richard E. Bell, Princeton, Ind., assignor to AMF Incorporated
Filed June 18, 1970, Ser. No. 47,221
Int. Cl. H01h *5/18*
U.S. Cl. 335—205 11 Claims

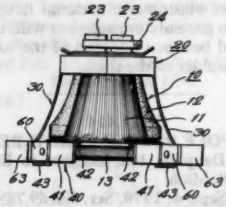
An improved precision-type snap switch with the same

package and operating characteristics as a conventional



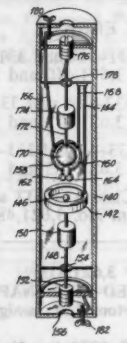
precision-type snap switch, and having magnetically actuated reed switches providing sealed contacts.

3,621,416
DEFLECTION YOKE
Koji Yabase, Tokyo, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan
Filed Apr. 21, 1970, Ser. No. 30,549
Claims priority, application Japan, Apr. 24, 1969, 44/37988
Int. Cl. H01f *1/00*
U.S. Cl. 335—212 **3 Claims**



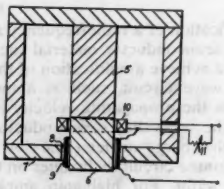
A deflection yoke wherein a resilient connecting arm is extended to an enlarged front portion of a horizontal deflection coil from opposite sides of a flange portion provided at the rear end, and insulating mount frames each to be mounted on the opposite sides of the horizontal deflection coil are provided at the extended end of the connecting arm, to which a rotating corrective magnet is secured.

3,621,417
MAGNETICALLY RESPONSIVE SWITCHING APPARATUS
Josef E. Halaby, Brooklyn, N.Y., assignor to Alarm Products International, Inc., Long Island City, N.Y.
Filed Mar. 10, 1970, Ser. No. 18,258
Int. Cl. H01h *51/28*
U.S. Cl. 335—205 **16 Claims**



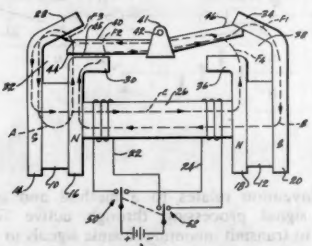
Magnetically responsive switches are provided which have contacts which are normally open or normally closed or sets of contacts which are respectively closed and open. In those switches having both the open and closed sets of contacts, provision is made for distinguishing between the presence of one controlling magnet or more than one. In the presence of one magnet, the set of contacts which is normally open is closed. The introduction of a second magnet will cause one or the other of the sets to open. Provision is made for adjustment of the responses to magnetic forces and to avoid the effects of residual magnetism.

3,621,418
TRANSDUCERS
Bernard Stuart Baker, Conventry, England, assignor to Courtaulds Limited, London, England
Filed Aug. 13, 1969, Ser. No. 849,773
Claims priority, application Great Britain, Aug. 26, 1968, 40,605/68
Int. Cl. H01f *27/42*
U.S. Cl. 335—222 **6 Claims**



A transducer comprising an electrical conductor located in the field of a permanent magnet or an electromagnet, whereby, by passing a current through the conductor, force will be caused to act between the conductor and the magnet, the transducer including a further electrical conductor connected in a circuit with the first-mentioned conductor so as to carry a current related to the current through the first-mentioned conductor and such as to tend to nullify the effect of that current to alter the field of the magnet linking the first-mentioned conductor. A transducer element is also claimed.

3,621,419
POLARIZED LATCH RELAY
Andrew O. Adams, Inglewood, and Roman J. Capol, Norwalk, both of Calif., assignors to Leach Corporation, South Pasadena, Calif.
Filed Feb. 19, 1970, Ser. No. 12,592
Int. Cl. H01h *51/22*
U.S. Cl. 335—230 **10 Claims**

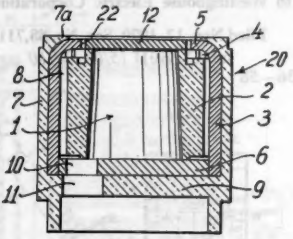


A polarized latch relay with an exceptionally strong holding characteristic in either latched condition. The relay comprises two permanent magnets, each between a respective pair of pole pieces; an armature pivotally supported apart from the permanent magnets and pole pieces with each of its ends disposed within a respective gap formed between extending end portions of each pair of pole pieces; and a core disposed between the permanent magnets and containing an electrically energizable coil wound thereon.

3,621,420
MAGNET SYSTEM FOR AN ELECTRODYNAMIC TRANSDUCER

Rudolf Gorike, and Wilhelm Kollesberger, both of Wien, Austria, assignors to AKG Akustische u. Kino-Gerate Gesellschaft mbH, Wien, Austria

Filed Jan. 12, 1970, Ser. No. 2,595
Claims priority, application Austria, Jan. 14, 1969, A 342/69
Int. Cl. H01f 7/00
U.S. Cl. 335—231 8 Claims

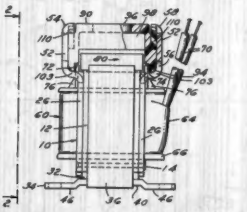


A magnet system for an electrodynamic transducer includes a magnetic core with a cover of a thermoplastic material thereon which includes a plurality of radially extending longitudinal ribs on its side face and studs which project from its end face and which bear against an inturned end wall of a magnetic cup. The ribs in turn bear against the sidewall of the cup. The cup is provided with an aperture to receive a pole plate which is attached to the magnetic core and which defines an airgap with the edge of the end wall of the cup which bounds the pole aperture in the cup. A baseplate is disposed over the opposite end of the core to retain the magnetic core in position within the cup. An external cover of thermoplastic material is then applied over the magnetic cup and the baseplate leaving the pole aperture in the end wall of the magnetic cup free. The cover is made of a plastic material which contracts to a greater degree than the metal, so that all of the metal parts are pressed firmly against each other by the external coating of plastic material. With the method of the invention, the external coating of thermoplastic material is applied so that the pole aperture is opened to permit the pole plate to be secured to the magnetic core and this is advantageously done for example, by means of an adhesive applied with the aid of a gap-forming tool.

3,621,421
SOLENOID HAVING IMPROVED BACKSTOP

Louis R. Conrath, Huntington Woods, Mich., assignor to Detroit Coil Company, Ferndale, Mich.

Continuation-in-part of application Ser. No. 726,291, May 3, 1968. This application Dec. 9, 1969, Ser. No. 883,509
Int. Cl. H01f 7/12
U.S. Cl. 335—257 18 Claims

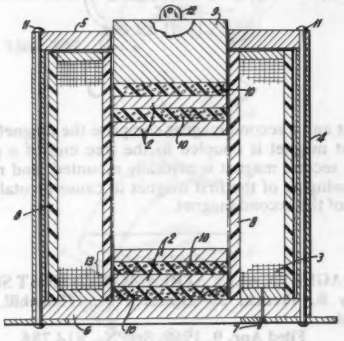


An industrial type AC solenoid comprising a stator having its laminations and sideplates riveted together as an integral assembly, and provided with a backstop member which absorbs the impact of the return stroke of the plunger, and which is readily connected in interlocking engagement with the sideplates of the stator, after the coil and plunger are inserted, by sliding the backstop between the sideplates.

3,621,422
MAGNETIC ACTUATOR

James C. Macy, North Lavallette, N.J., assignor to Thrust Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 663,792, Aug. 28, 1967, which is a continuation-in-part of application Ser. No. 486,454, Sept. 10, 1965, now Patent No. 3,376,528, Continuation-in-part of Ser. No. 715,387, Mar. 22, 1968, Pat. No. 3,467,927, continuation-in-part of Ser. No. 486,454, Sept. 10, 1965, Pat. No. 3,376,528, continuation-in-part of 663,792, Aug. 28, 1967. This application Dec. 19, 1969, Ser. No. 886,451
Int. Cl. H01f 7/08
U.S. Cl. 335—264 9 Claims



A magnetic actuating device wherein the existing magnetic gap is broken up into a plurality of increments. Elastic material is affixed between adjacent segments or core pieces within the gap to limit the maximum and minimum separations between adjacent segments or core pieces, to provide a restorative force, and to maintain the segments or core pieces in alignment. The size of the gap may be positively limited by affixing either the elastic segments or the magnetic segments to a chain have relatively movable links or beads.

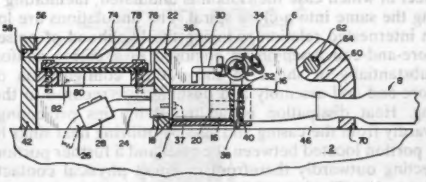
ERRATUM

For Class 335—264 see:
Patent No. 3,621,451

3,621,423
TERMINAL BOX FOR LIFTING MAGNET

Jerry L. Swope, Columbus, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 25, 1969, Ser. No. 810,217
Int. Cl. H01f 7/20
U.S. Cl. 335—290 11 Claims

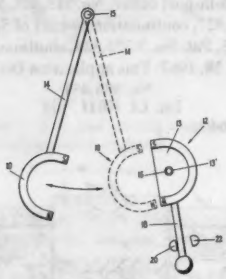


A terminal box for a lifting magnet is disclosed which may be separately fabricated and then attached to the lifting magnet. The terminal box is provided with an easily removable cover which clamps an incoming power-source cable to relieve internal cable-connection stress. Removal of the cover allows access to the internal cable connections without removal of the entire terminal box. The incoming power-source cable is held locked to the internal cable by an easily removable pin which is permanently attached to the terminal box.

3,621,424
MAGNETIC ENGINE

Joseph Query, 117 Summer St., Somerville, Mass.

Filed Oct. 19, 1970, Ser. No. 81,683
Int. Cl. H01f 7/02
U.S. Cl. 335—306 4 Claims

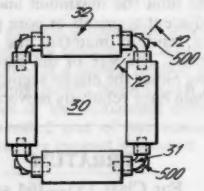


A first and a second magnet comprise the magnetic engine. The first magnet is coupled to the free end of a pendulum and the second magnet is pivotally mounted, and responsive to the swinging of the first magnet to cause pivotal or rotary motion of the second magnet.

3,621,425
MAGNETICALLY STREAMLINED HEAT SINK

Anthony B. Trench, 25 Elizabeth St., Thornhill, Ontario, Canada

Filed Apr. 9, 1969, Ser. No. 814,786
Claims priority, application Canada, Apr. 11, 1968, 017325
Int. Cl. H01f 27/08
U.S. Cl. 336—61 10 Claims

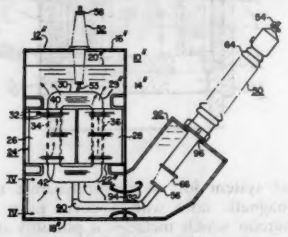


A transformer of the shell-core type having two or more conductive coils physically in the form of closed loops and located side-by-side along a common axis with magnetizable material being provided by a ribbon of grain-oriented steel spirally wound around the legs of the coils to embrace the latter. The magnetizable material may be provided by concentric cylinders of spirally wound ribbon steel with adjacent spirals having the ribbons located substantially perpendicular to one another. A cylinder with the ribbon perpendicular to the axis of the cylinder may be formed of a grain-oriented steel in which case the ribbon is undulated, facilitating bending the same into a close spiral. The undulations are located in internested relation reducing the likelihood of noise. The core-and-coil assembly is enclosed in a casing conforming substantially in shape to the outline configuration of the core-and-coil assembly and bushings are secured to the casing. Heat dissipation is facilitated by fins projecting outwardly from the casing and also by utilizing heat sinks having a portion located between the coils and a further portion projecting outwardly therefrom in direct physical contact with the casing. The heat sinks are preferably located so as not to intersect the high-density magnetic flux. The transformers may be constructed as identical units which may be stacked for increasing capacity and in which case the terminals are located electrically to interconnect adjacent units simultaneously with physically placing such units in stacked relation. A method of forming a coil is provided which includes simultaneously insulating the conductor turns one from the other and encapsulating the coil in a potting compound. To effect this, a spacer is applied to the conductor in the form of glass strands spirally wound onto the conductor and the conductor is thereafter wound into a closed-loop coil. The formed coil is then placed in apparatus for impregnating the coil with an encapsulant. The same method is utilized to form a transformer with the encapsulation being effected with the core-and-coil assembly physically located within the transformer casing.

3,621,426
TRANSFORMER WITH BUSHING COMPARTMENT

Saul Bennon, and Harold R. Moore, both of Muncie, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1970, Ser. No. 88,711
Int. Cl. H01f 15/04, 27/10
U.S. Cl. 336—58 8 Claims

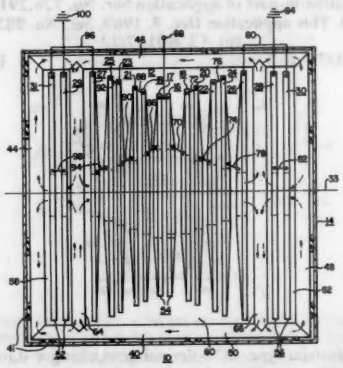


Electrical inductive apparatus of the shell-form type, having a tank filled with a liquid dielectric, and a magnetic core winding assembly disposed in the tank and immersed in the liquid dielectric. The magnetic core winding assembly includes a magnetic core, and one or more windings formed of a plurality of axially spaced pancake coils which link the magnetic core and extend outwardly therefrom above and below the magnetic core, towards the cover and bottom portions of the tank, respectively. At least the connection to the high-voltage winding is made by a lead assembly connected to a pancake coil at a point below the magnetic core. The other end of the lead assembly is connected to the encased end of high-voltage bushing assembly which is mounted in a separate bushing compartment attached to a sidewall portion of the tank, through aligned openings in the tank and bushing compartment.

3,621,427
ELECTRICAL REACTOR

Saul Bennon, Muncie, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 13, 1970, Ser. No. 89,398
Int. Cl. H01f 15/04
U.S. Cl. 336—84 16 Claims

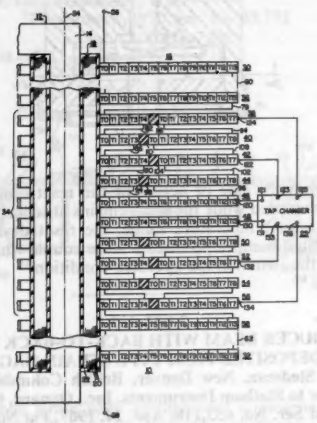


A shunt reactor, including at least two opposing winding sections separated by magnetic shielding material. Saturation of the magnetic shielding material at a predetermined voltage produces a large drop in the reactance of the reactor, due to interaction of the opposing fluxes of the winding sections.

3,621,428
ELECTRICAL WINDINGS AND METHOD OF CONSTRUCTING SAME

Robert L. Johnston, Sharon, and Wallace G. Chambers, West Middlesex, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1970, Ser. No. 75,126
Int. Cl. H01f 21/00
U.S. Cl. 336—146 20 Claims

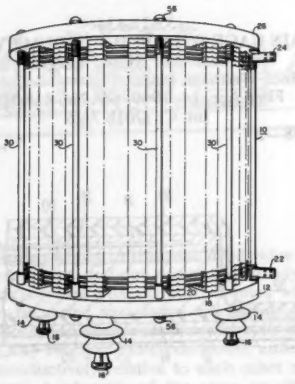


A tapped winding for electrical inductive apparatus, and method of constructing same, including a plurality of axially spaced pancake or disk-type continuous coils. Each turn to be tapped is directed to the outermost turn of a pancake coil by successively winding and interconnecting a first portion of a plurality of pancake coils, proceeding from coil to coil in a first axial direction, and returning in the opposite axial direction to complete each pancake coil, with the number of turns added to complete each pancake coil being predetermined to locate the taps at the outer turns of certain pancake coils.

3,621,429
AIR CORE REACTOR

Frank W. Benke, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1970, Ser. No. 88,289
Int. Cl. H01f 27/30
U.S. Cl. 336—197 7 Claims

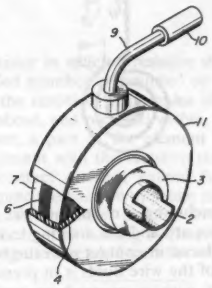


An air core reactor comprising a bottom member having a plurality of slotted cleats stacked thereon. Turns of conductors positioned in the slots in the cleats. A top member on top of the stacked cleats. Resin-impregnated fiber glass tie rods connected between the bottom member and the top member for holding the reactor assembled. A nonmagnetic metallic fitting on each end of each tie rod. The nonmagnetic metallic fittings are permanently attached to each end of the tie rods by forcing a tapered insert member into each end of the tie rods.

3,621,430
FLYBACK TRANSFORMER COIL FOR TELEVISION RECEIVER

Yohei Shimizu, Nishinomiya, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi-shi, Japan

Continuation of application Ser. No. 771,297, Oct. 28, 1968, now abandoned. This application Apr. 2, 1970, Ser. No. 22,138
Int. Cl. H01j 27/30
U.S. Cl. 336—205 3 Claims

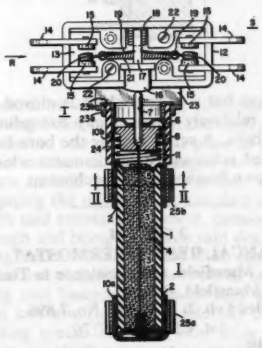


Flyback transformer coil for television receiver comprises surface-insulated wire windings having a plurality of wire layers, a plurality of layers of insulating material thereby to separate adjacent layers of wound wires, and an assembly of the wirings and interpositioned insulating material being impregnated with a liquid heat-setting 1-2 polybutadiene resin having a lower dielectric loss at both low and high temperatures, for example 20°—150° C., and heated and hardened, thereby to deposit a hardened layer of the resin in all the layers of the coil assembly.
The present coil has a good water, moisture and burning resistances and good insulating efficiency.

3,621,431
BLOWN-FUSE INDICATOR INCLUDING A CIRCUIT-CONTROLLING SWITCHING DEVICE

Paul C. Hitchcock, Sr., Haverhill, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Dec. 23, 1969, Ser. No. 887,504
Int. Cl. H01h 85/30
U.S. Cl. 337—5 7 Claims



A unit including an indicating fuse and a switching device under the control of said indicating fuse is designed to be

more compact and easier to manufacture than comparable prior art devices. This is achieved by providing a tubular member of insulating material mounted on one of the terminal caps of an indicating fuse, covering but one portion of the particular cap, and exposing another portion thereof, said tubular member of insulating material forming a support for a switching device which includes relatively movable contact means.

3,621,432
THERMOSTAT

Roland D. Beck, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

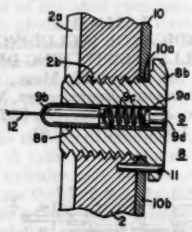
Filed Apr. 27, 1970, Ser. No. 32,304
Int. Cl. H01h *37/34, 61/013*
U.S. Cl. 337—100 **5 Claims**

A thermostat including a nichrome wire anticipator. The wire is bent into an arc and has a spring to it. The wire, bare of insulation, is placed in contact with the bare bimetal. The spring character of the wire holds it in pressure contact with the bimetal. The wire is everywhere insulated from the bimetal except over a relatively short length of the wire near the midpoint along its length for maximum heat conduction with the bimetal shorting out a substantial length of the wire.

3,621,433
ELECTRIC CARTRIDGE FUSE HAVING PLUG TERMINALS

Richard A. Belcher, Hampton Falls, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed May 7, 1970, Ser. No. 35,465
Int. Cl. H01h *85/30*
U.S. Cl. 337—244 **7 Claims**



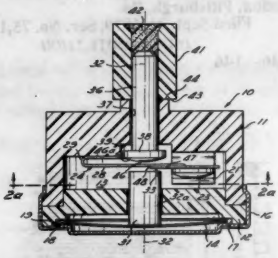
An electric fuse has a casing which is closed by terminal plugs having a relatively large axially extending internally screw-threaded bore. A screw closing the bore has an axially extending bore of relatively small diameter which houses a spring-biased blown fuse indicator mechanism.

3,621,434
MANUAL RESET THERMOSTAT

Anton J. Gerich, Mansfield, Ohio, assignor to Therm-O-Disc., Incorporated, Mansfield, Ohio

Filed Feb. 2, 1970, Ser. No. 7,896
Int. Cl. H01h *37/70*
U.S. Cl. 337—348 **8 Claims**

A trip-free manual reset thermostat wherein the travel of the reset device is limited so that the disc cannot be moved all the way to its reset position of stability. The reset device engages one side of the cantilever mounted flexible switch arm. Such switch arm is formed with an offset so that the disc-operated bumper engages the switch arm at a point



spaced from the line of action of the reset bumper. When reset is attempted while the disc remains at temperatures outside the reset temperature range, the reset device and the disc-operated bumper produce a force couple which tends to maintain the switch in the operated condition.

3,621,435
TRANSDUCER BEAM WITH BACK-TO-BACK RELATED DEPOSITED FILM TYPE STRAIN GAGES

Cecil K. Stedman, New Denver, British Columbia, Canada, assignor to Statham Instruments, Inc., Oxnard, Calif.

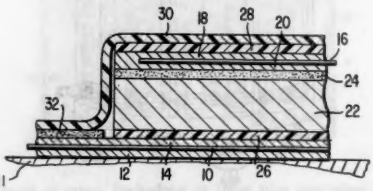
Division of Ser. No. 633,116, Apr. 24, 1967, Pat No. 3,479,739.
Continuation-in-part of application Ser. No. 817,008, Apr. 17, 1969, now abandoned. This application Mar. 23, 1970, Ser. No. 21,560
Int. Cl. G01b *7/16*
U.S. Cl. 338—2 **11 Claims**

Transducer structure in the nature of a thin, laminated, flexural element having evaporated film strain gages on each of two opposite surfaces. Fabrication method involving simultaneously depositing by a single-vapor source plural films of a strain sensitive electroconductive material onto insulative front surface areas of two separate or separable parts of a sheet material, to form two substantially identical bridge arm means, then bonding the two parts together, back-to-back.

3,621,436
STRAIN GAGE WITH BUILT-IN DUMMY GAGE

Charles T. Wu, Marlboro, Mass., assignor to BLH Electronics, Inc., Waltham, Mass.

Filed Apr. 14, 1969, Ser. No. 815,709
Int. Cl. G01b *7/16*
U.S. Cl. 338—3 **3 Claims**



An electrical strain gage unit including an active strain gage, a laminate formed by an inactive or "dummy" strain

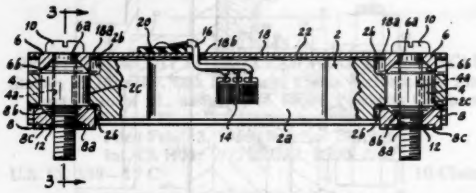
gage bonded to a small block of rigid material with the laminate isolated from the active strain gage by a layer of high-lubricity material, a flexible plastic film enveloping the inactive gage and adhesively attached about the periphery thereof to the active strain gage, and a layer of high-lubricity material between the covering and the inactive gage.

3,621,437

BOLT-ON STRAIN GAGE TRANSDUCER STRUCTURE

James E. Mading, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 5, 1970, Ser. No. 43,772
Int. Cl. G01b 7/18
U.S. Cl. 338—5 8 Claims



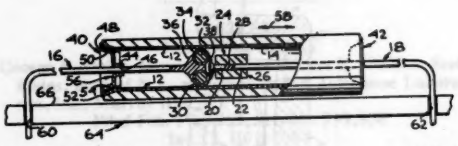
A resistance strain gage arrangement is mounted upon a strain bar housed within a protective enclosure. Opposite ends of the strain bar are provided with upper and lower spherical surfaces which are received within conical recesses of upper and lower washer-type seats. The spherical ends and seats have oversized clearance holes for a pair of screws which extend through the assembly at each end of the strain bar to provide a gimballike mounting for the structure to compensate for surface and bolt hole irregularities. Once firmly tightened to the surface to be monitored, the structure is designed to transmit strain from the surface to the strain bar where it is sensed by the resistance strain gage arrangement.

3,621,438

VARIABLE RESISTORS

Charles S. Wright, 5901 Fulton Ave., Van Nuys, Calif.

Division of Ser. No. 714,108, Mar. 18, 1968, Pat. No. 3,456,228, Continuation of application Ser. No. 379,453, July 1, 1964, now abandoned. Filed Mar. 20, 1969, Ser. No. 822,781
Int. Cl. H01c 9/02
U.S. Cl. 338—150 4 Claims



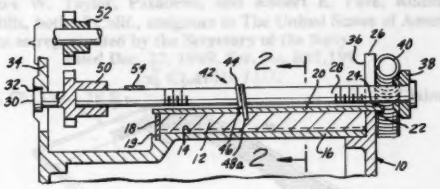
Variable resistors having at least one fixed value resistance element, terminal caps, and one or more relatively rigid terminal lead rods provided with a contact element whereby the resistance can be varied by relative movement of the case and the terminal lead rod or rods. Internal ends of opposite terminal rods may be rigidly interconnected, either conductively or nonconductively relative to each other and/or the contact element. A plurality of the same or differing resistance elements may be electrically connected in series or parallel for maintaining the same and/or permitting variations in one or more electrical characteristics.

3,621,439

VARIABLE RESISTOR

Meigs W. Newbery, East Longmeadow, Mass., assignor to General Instrument Corporation, Newark, N.J.

Filed June 8, 1970, Ser. No. 44,160
Int. Cl. H01c 9/02
U.S. Cl. 338—180 16 Claims



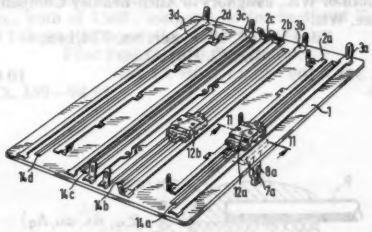
A variable resistor in which a resistive strip is mounted on a base, a threaded member is mounted on the base adjacent and parallel to the resistive strip, and a sliding contact element is wound about, and received within, the threads of the threaded member, a part of the element being in constant electrical engagement with the resistive strip. The free ends of the sliding contact element extend from the threaded member and engage the base on opposite sides thereof. Rotation of the threaded member urges a free end against the base, thereby relaxing the winding sufficiently for the contact to be moved along the threaded member within the threads.

3,621,440

SLIDE RESISTOR

Helmut Eberwein, Wollbachstr. 179, 874 Brendlorenzen, and Wolf-Erhard Steigerwald, 31 1/6, 8741 Leutershausen, both of Germany

Filed Nov. 17, 1969, Ser. No. 877,142
Claims priority, application Germany, Nov. 20, 1968, G 68 07 771
Int. Cl. H01c 9/02
U.S. Cl. 338—183 7 Claims



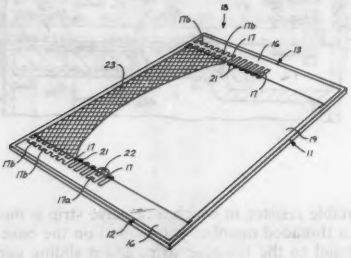
A slide resistor or voltage divider comprising an insulating baseplate having a slot or slots therethrough and a resistance element applied to one side of said plate in parallel relation to said slot, a contact carrier arranged on the same side of said baseplate as said resistance element, a slide element slidingly engaging the side of said baseplate opposite its side provided with said resistance element, connecting means extending through and being guided in said slot or slots and interconnecting said carrier and said slide element, a control knob provided on said slide element on its side opposite the side engaging said baseplate. Slide resistor of the described type wherein said control knob is laterally offset relative to said connecting means and said slot. Slide resistor of the described type in which a current contacting resistance element and/or a bus bar are provided on opposite sides of said slot but on the same side of said baseplate.

3,621,441

FILM RESISTOR ADJUSTABLE BY ISOLATING PORTIONS OF THE FILM

Joseph R. Hudnall, Lancaster, and Paul C. Wergin, Reynoldsburg, both of Ohio, assignors to Western Electric Company Incorporated, New York, N.Y.

Filed July 17, 1969, Ser. No. 842,562
Int. Cl. H01c 9/00
U.S. Cl. 338—195 2 Claims



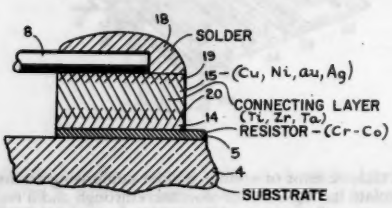
A film resistor includes a pair of conductive films which are spaced from each other and are deposited adjacent to opposite edges of one surface of a substrate. A plurality of spaced, parallel fingers extend transversely from each of the conductive films and partially into the space between the conductive films on the substrate. A resistive film is deposited onto the substrate in the space between the conductive films and overlaps the free ends of the fingers. The resistance value of the film resistor can be adjusted by removing selectively some or all of the fingers so that adjacent portions of the resistive film are substantially isolated electrically when the resistor is used in an environmental circuit even though the entire resistive film remains attached physically to the substrate and unmarred.

3,621,442

TERMINAL CONNECTION OF ELECTRONIC DEVICES

Willis J. Racht, South Milwaukee, and Paul Pfister, Milwaukee, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Nov. 7, 1968, Ser. No. 774,146
Int. Cl. H01c 7/00
U.S. Cl. 338—309 10 Claims



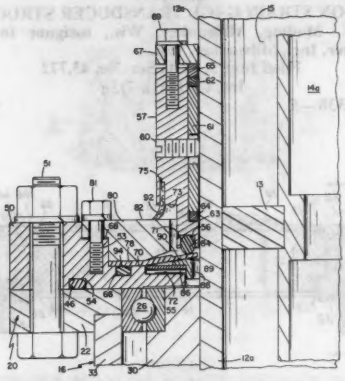
A process involving and connection for a chromium based electrically functioning portion supported on a substrate. A connecting layer is deposited and is bonded to the selected parts of the portion and comprises metals preferably taken from the group consisting of titanium, zirconium, tantalum and combinations thereof. A second layer is deposited over the connecting layer which will permit soldering if the connection is to be a termination or will become a conductor for interconnection on the substrate. This deposition of the second layer begins before the deposition of the connecting layer is phased out.

3,621,443

ELECTRICAL TRANSMISSION LINE

Donald N. Sewell, Raymond, Maine, assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Apr. 10, 1969, Ser. No. 814,969
Int. Cl. H01r 39/02
U.S. Cl. 339—8 4 Claims



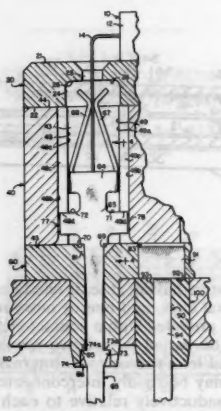
A rotary joint for an RF transmission line includes a flexible plastic disc member having a smooth annular surface adjacent its inner periphery, structure for clamping the outer periphery of the disc to one section of the transmission line and a surface of elastomeric material softer than the annular surface of the disc member secured to the other section. The inner peripheral surface of the disc is urged, by gas pressure in the line and/or a biasing structure, against the surface of elastomeric material. This structure provides a gastight seal so that a gaseous dielectric may be maintained under pressure within the transmission line.

3,621,444

INTEGRATED CIRCUIT MODULE ELECTRICAL CONNECTOR

Max M. Stein, Willow Grove, Pa., assignor to Elco Corporation, Willow Grove, Pa.

Continuation of application Ser. No. 735,714, June 10, 1968, now abandoned. This application June 1, 1970, Ser. No. 42,551
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 10 Claims



An electrical connector comprises an insulating housing having a plurality of contact openings extending

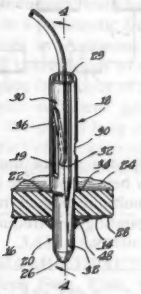
therethrough. A contact is positioned within each of said openings, and a separate lid is removably mounted on the upper surface of said insulating housing. The lid is provided with a plurality of lead openings, each lead opening being in direct alignment with, and in communication with a corresponding contact opening in the insulating housing. An adapter for insulating the contacts of the electrical connector from a metal plate is comprised of a flat insulating member having an upper and a lower surface. A plurality of hubs are integrally molded with said lower surface and extend downwardly therefrom. A plurality of tail-receiving openings are provided in the adapter, each such opening extending through the upper surface of the flat insulating member and a respective hub to receive the tail portion of a contact therein. The flat insulating member also comprises a plurality of terminal openings adjacent the tail-receiving openings, each terminal opening being adapted to accommodate a portion of a terminal pin mounted in, and grounded to the metal plate.

3,621,445

PRINTED CIRCUIT BOARD LEAD WIRE RECEPTACLE

Stanley V. Horecky, Oak Park, and Cletus McDonough, Elmhurst, both of Ill., assignors to Molex Products Company, Downers Grove, Ill.

Filed Feb. 13, 1969, Ser. No. 798,936
Int. Cl. H01r *9/12, 11/22;* **H05k** *1/12*
U.S. Cl. 339—17 C **10 Claims**



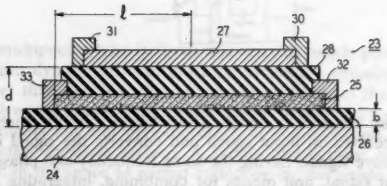
A connector terminal including a cylindrically shaped, rolled, hollow body having an opening or separation extending the length thereof. A first, narrowed end of the body is received in an aperture in a printed circuit board and is soldered to a corresponding conductor printed on the latter. The second end of the terminal extends outwardly from the opposite surface of the printed circuit board and includes resilient means therein. A lead wire of an electrical component inserted into the second end of the body of the connector terminal is engaged by said resilient means electrically to interconnect the printed conductor and electrical component.

3,621,446

THERMAL RELAY

George E. Smith, Murray Hill, and Robert H. Walden, Scotch Plains, both of N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Feb. 17, 1969, Ser. No. 799,808
Int. Cl. H01c *7/04*
U.S. Cl. 338—23 **9 Claims**



In a thermal relay of the type using a conductive heater layer to switch a layer of vanadium dioxide between nonconducting and conducting states, design advantages are attained by using a conductive substrate separated from the vanadium dioxide by a layer of insulative material having a thermal conductance per unit area that is within certain prescribed limits.

3,621,447

DEEP SUBMERGENCE ELECTRICAL ASSEMBLY

James W. Taylor, Pasadena, and Robert E. Pace, Rolling Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 22, 1969, Ser. No. 887,199
Int. Cl. H01r *11/32*
U.S. Cl. 339—29 R **9 Claims**

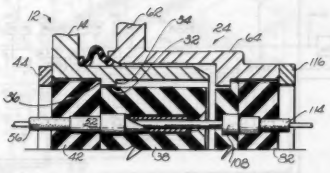
A deep submergence electrical assembly including a pair of spaced-apart connectors; a flexible tube sealably connected at each end to a respective connector; at least one wire extending through the tube between the connectors; and the flexible tube being filled with an electrical resistance liquid. The tube may be constructed of plastic, and one of the connectors may have a fill hole and the other connector may have a vent hole for filling the tube with the liquid. One of the connectors may be a socket housing for an underwater light and one or both of the connectors may include a pressure plate which is adapted for sealable connection to a pressure hull.

3,621,448

ACCORDION SEAL FOR ELECTRICAL CONNECTORS

Bruce K. Arnold, Pasadena, and Edward C. Paugh, Hacienda Hgts., both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 26, 1970, Ser. No. 14,579
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 M **4 Claims**

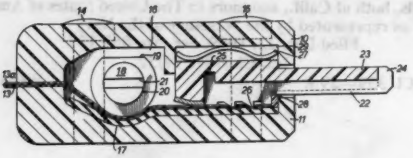


An accordion seal for electrical connectors for sealing the external surfaces of a pair of mated connectors. The seal comprises a rear portion which is secured to a surface of the connector shell. The front portion of the shell engages the other connector member with the intermediate portion folding in an accordion fashion as the connector shells are drawn closer together. Moreover, the intermediate portion may be formed of a plurality of rippled sections, the sections folding in accordion fashion upon mating of the connector shells.

3,621,449
ELECTRICAL CONNECTORS

Kenneth F. Bridle, London, England, assignor to A. B. Electronic Components Limited, Abercynon, Glamorgan, Wales

Filed May 21, 1969, Ser. No. 826,641
Claims priority, application Great Britain, May 22, 1968, 24,429/68
Int. Cl. H01r *11/20*
U.S. Cl. 339—99 R 5 Claims



An electrical connector for a tape cable which consists of metallic tapes embedded side-by-side in an insulating medium consisting of a housing carrying an electrical contact, a rotatable member within the housing and having a portion of its diameter of greater radius and a portion of lesser radius means for clamping the tape cable with respect to the housing. The rotatable member engages the tape cable within the housing so that, when the connector is assembled and the member rotated, the portion of the rotatable member having the greater radius comes into contact with the tape cable and the cable is drawn longitudinally across the teeth on the electrical contact so that the teeth plough through the insulating medium and establish electrical contact with the metallic tape.

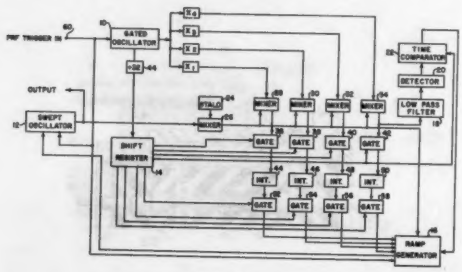
ERRATUM

For Class 339—103 see:
Patent No. 3,621,413

3,621,450
LINEAR SWEEP FREQUENCY GENERATOR WITH SAMPLING CIRCUIT PHASE CONTROL LOOP

Lloyd R. Blair, and Gregory L. Martin, both of Phoenix, Ariz., assignors to Goodyear Aerospace Corporation, Arkon, Ohio

Filed Dec. 15, 1969, Ser. No. 884,927
Int. Cl. H03b *3/04, 23/00*
U.S. Cl. 331—10 5 Claims

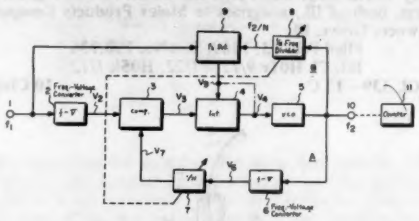


The invention includes means to generate a substantially linear FM waveform pulse. A phase comparison of the FM waveform pulse is made with respect to several reference constant frequency waveform signals whose frequencies and phase are made to match an ideal FM waveform pulse at preselected points during the pulse. The frequencies of the reference signals are chosen to be multiples of a reference oscillator. The frequency of the oscillator is chosen to give the desired number of correction points during the pulse. The FM waveform pulse and the reference signals are mixed in separate mixers and the output of each mixer is sampled at a predetermined time by a gate. The outputs of the gates are then integrated and used to correct the FM waveform pulse over the time interval just prior to the sample time. This system will reach a stable equilibrium when the phase of the reference signals and the FM waveform pulse are in phase quadrature since the output of all the mixers are zero for this condition. When a sufficient number of samples are taken, the FM waveform pulse at equilibrium is a highly linear signal.

3,621,451
FREQUENCY MULTIPLIER

Glichi Yokoyama, and Yoshihisa Kameoka, both of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 16, 1970, Ser. No. 11,662
Claims priority, application Japan, Feb. 26, 1969, 44/13934
Int. Cl. H03b *3/06*
U.S. Cl. 331—11 3 Claims

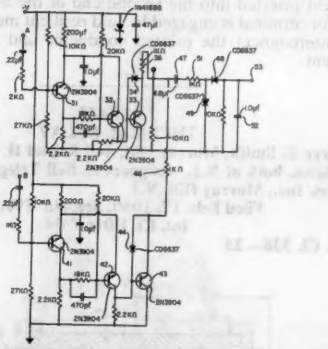


A frequency-multiplying device multiplies frequencies of input signals by N (N being a positive integer). The multiplying device can feed multiplied signal frequencies into an electronic counter for counting low frequency input frequencies quickly with high accuracy.

3,621,452
PHASE DETECTOR AND OSCILLATOR SYSTEM

Eugene Y. Ho, San Carlos, Calif., assignor to Farinon Electric, San Carlos, Calif.

Filed Nov. 20, 1969, Ser. No. 878,424
Int. Cl. H03b *3/04*
U.S. Cl. 331—25 3 Claims



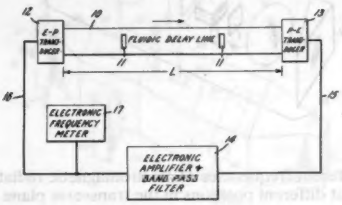
A phase detector comprising two trigger circuits each of which receives an input signal and converts the signal into square wave signals having the same frequency and phase as the input signal, and means for combining, integrating and rectifying the combined signal to provide an output signal which is proportional to the phase difference.

3,621,453

ELECTROFLUIDIC DELAY LINE OSCILLATOR

Carl G. Ringwall, Scotia, and Salvatore Bottone, Jr., Schenectady, both of N.Y., assignors to General Electric Company

Filed June 19, 1969, Ser. No. 834,840
Int. Cl. H03b 5/34
U.S. Cl. 331—64 10 Claims



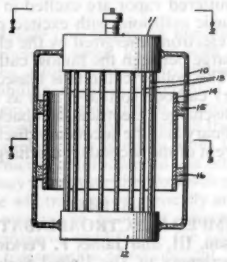
A closed loop oscillator circuit consists of a tubing of predetermined length, an electrical-to-pneumatic transducer, a pneumatic-to-electrical transducer and an electronic amplifier. The electrical-to-pneumatic transducer converts an electrical frequency signal to a pneumatic frequency signal which generates pressure waves in a gaseous medium within the tubing. The tube length corresponds to one or multiple half-wavelengths of a reference frequency of oscillation. The electronic amplifier provides sufficient gain to maintain self-sustained oscillation in the closed loop circuit. The temperature or gas content (ratio) of the gaseous medium within the tubing can be determined from the actual oscillation frequency in the circuit.

3,621,454

PLASMA MULTIPACTOR

Gene A. Meeks, American Fork, Utah, assignor to International Telephone Laboratories and Telegraph Corporation, Nutley, N.J.

Filed Feb. 7, 1969, Ser. No. 797,473
Int. Cl. H03b 9/02, 11/08
U.S. Cl. 331—92 8 Claims



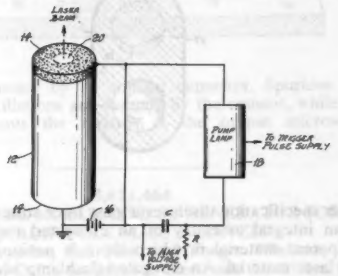
A multipactor tube includes a permeable anode positioned between dynode surfaces having a secondary emission ratio greater than one. An alternating voltage between the anode and dynodes causes ionization of a gas therein and results in continuous ion and periodic electron bombardment of the secondary emissive surface. A supply of electrons is maintained in the space to permit collection by the anode during intervals between electron bombardment. This facilitates self starting and sustaining of the multipactor oscillation and multiplication operation.

3,621,455

PINCH EFFECT LASER

Milton Green, 926 Buddington Road, Groton, Conn.

Continuation-in-part of application Ser. No. 661,732, Aug. 18, 1967, now abandoned. This application July 28, 1970, Ser. No. 59,040
Int. Cl. H01s 3/18
U.S. Cl. 331—94.5 7 Claims



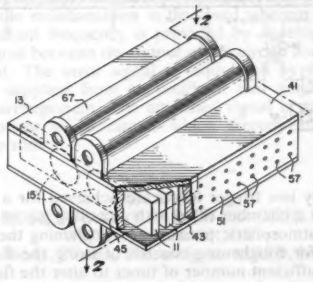
A semiconductor laser in which the efficiency is improved by forcing the PN pairs into the central volume of the laser rod. The redistribution of PN pairs is effected by adding one or more magnetic or electric fields or both to the semiconductor laser device in such a manner that a radially inward Lorentz force is produced on all charge carriers. The fields which are used can be an axial (with respect to the laser rod) invariant magnetic field, an axial electric field, a combination of an axial invariant magnetic field and an azimuthal electric field, or a combination of an invariant, axial magnetic field and a properly superposed *r f* induction field. Pumping is accomplished by optical excitation, or hot charge carrier injection, or both.

3,621,456

DISC LASER SYSTEM

Charles Gilbert Young, Southwood Road, Storrs, Conn.

Filed Mar. 24, 1969, Ser. No. 809,641
Int. Cl. H01s 3/02, 3/06
U.S. Cl. 331—94.5 12 Claims

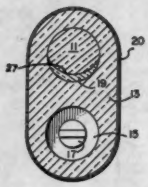


This specification discloses a disc laser system in which discs of laser glass are mounted in plates arranged in a parallel spaced relationship to permit coolant to flow therebetween. The discs are aligned in a plurality of rows and a laser cavity is made to extend through the rows in series. Elongated flash lamps extend parallel to the rows to excite the laser glass of the discs. The plates contain reflective surfaces to reflect pump light in a way to maximize the percentage of pump light entering the laser discs.

3,621,457
UNITARY GLASS LASER SYSTEM WITH ASYMMETRICAL PUMPING

David W. Cuff, Chepachet, R.I., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 1, 1969, Ser. No. 812,163
Int. Cl. H01s 3/09, 3/16
U.S. Cl. 331—94.5 11 Claims

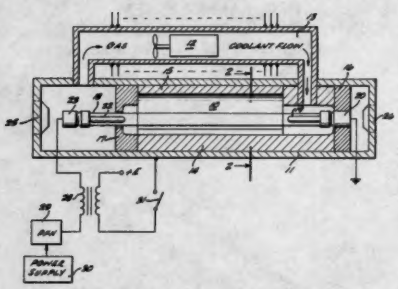


This specification discloses a glass laser structure comprising an integral assembly of an elongated matrix body of transparent material in which there is positioned a rod of glass laser material. An elongated flashlamp is also provided in the matrix body extending parallel to the laser rod. A section of transparent material adjacent to the side of the rod near the flashlamp has a lower index of refraction than the material of the laser rod. The remainder of the matrix has a higher index of refraction than the laser rod. Said transparent material may be made lossy for the wavelength at which the laser emits.

3,621,458
FLASHTUBES AND METHOD OF PROVIDING SAME

Amado Y. Cabezas, Los Angeles, and Walter Koechner, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 13, 1969, Ser. No. 865,789
Int. Cl. H01J 17/12, 61/10; H01s 3/00
U.S. Cl. 331—94.5 8 Claims



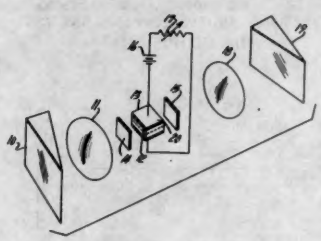
Uniformly low trigger levels are achieved for a flashlamp operated in a chamber filled with a cooling gas at high pressure or at atmospheric pressure by roughening the anode. A technique for roughening consists of firing the flashtube in reverse a sufficient number of times to alter the finish of the anode tip from a bright high polish to a dull gray by sputtering.

3,621,459
BROADBAND LASER AMPLIFIER

Goodwyn George Reeves, 3324 Octavia St., Raleigh, N.C.

Filed Dec. 11, 1969, Ser. No. 884,153
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 5 Claims

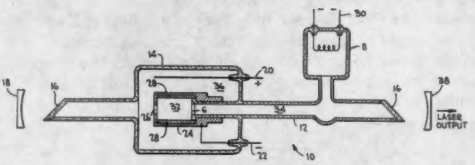
A broadband laser apparatus and method for amplifying optical frequencies of electromagnetic radiation at different positions utilizing a laser device in which the frequency-determining energy gap varies with the position in the plane normal to the direction of electromagnetic wave propagation so that different frequencies of electromagnetic radiation are amplified at different positions in the transverse plane.



3,621,460
SPUTTERED VAPOR LASER

Colin S. Willett, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army

Filed July 6, 1970, Ser. No. 52,497
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 9 Claims



A sputtered vapor laser which features two discharges within a single lasing apparatus. A secondary discharge is caused to occur between an anode and a hollow cathode whose surface is coated with a suitable lasing material. The sputtering action of the secondary discharge on the surface of the hollow cathode produces vapor of the lasing material inside the hollow cathode. The electric field set up by the cathode of the primary laser discharge acts to draw the vapor of the lasing material towards the primary cathode along the main plasma section of the laser to provide the required concentration of atoms in which to sustain laser oscillation. The atoms of the sputtered vapor are excited in the main plasma section by inelastic collisions with excited carrier gas atoms or ions or with electrons energized by the electric field existing in the discharge between the hollow cathode and the primary cathode. The hollow cathode is biased more positively than the primary cathode so that it acts as the anode of the primary laser discharge. Electrical feedback can be utilized between the primary and the secondary discharge circuitry to control the current of the secondary discharge.

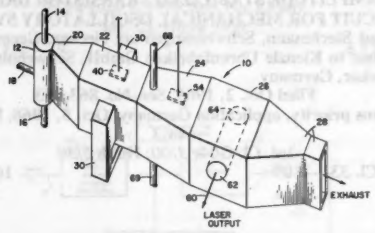
3,621,461
SELF-PUMPED ELECTROADIABATIC LASER

Charles M. Cason, III, and James F. Perkins, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 9, 1969, Ser. No. 857,645
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 24 Claims

An electroadiabatic laser wherein a plenum chamber is provided in which a thermally heated gas is mixed with a relatively cold gas to provide lasing action. An alkali metal compound is mixed simultaneously with the gases to provide additional stimulation of the ionized gases by releasing additional electrons during mixing of the gases. The expanding gases pass through a nozzle into an excitation chamber wherein the gas flows through a magnetic field between two electrodes, generating a current in an electrode load circuit

that is identical to the electron flow in the ionized gases. The flowing gases are further expanded through another nozzle into a larger cavity. A pair of electrodes in the second nozzle have an electric field thereacross for further stimulation of the lasing gas. Lasing action of the gas occurs in the larger cavity, a Fabry-Perot optical cavity, and the output therefrom is coupled out of the cavity by mirrors mounted



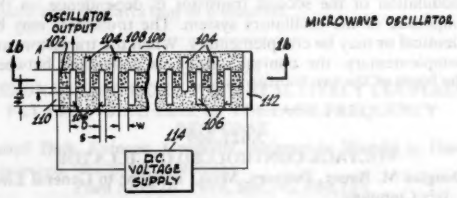
therein. The gases are then exhausted through a diffuser to atmospheric pressure. A magnet provides the magnetic field in the excitation chamber. The excitation chamber electrode load circuit may be connected to provide the potential across the nozzle electrodes, thus using only the field produced by the magnet to generate the additional potential for further stimulated emission.

3,621,462

AMPLIFIERS AND OSCILLATORS COMPRISED OF BULK SEMICONDUCTOR NEGATIVE RESISTANCE LOADED SLOW-WAVE STRUCTURE

Jacob Meyer Hammer, Trenton, and Bayram Vural, Princeton, both of N.J., assignors to RCA Corporation

Filed Dec. 23, 1969, Ser. No. 887,709
Int. Cl. H03b 7/14; H03f 3/10
U.S. Cl. 331—96 **9 Claims**



A microwave device comprising an iterative multielement slow-waveline structure, when loaded with a negative resistance formed by a longitudinally distributed semiconductor material exhibiting negative differential mobility when properly biased, provides gain for an electromagnetic wave propagated the length of the line, although the phase velocity of the electromagnetic wave is many times the carrier drift velocity in the semiconductor material. An interdigital line or a meander line may constitute the slow-wave structure. The microwave device will transmit reciprocally and will ordinarily operate as a microwave amplifier by the addition of means for rendering the transmission nonreciprocal.

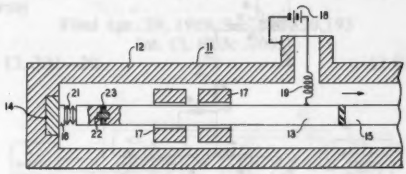
3,621,463

NEGATIVE RESISTANCE DIODE COAXIAL OSCILLATOR WITH RESISTIVE SPURIOUS FREQUENCY SUPPRESSOR

Hilding Matthews Olson, Jr., Mohnton, Pa., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Apr. 27, 1970, Ser. No. 32,191
Int. Cl. H03b 7/14
U.S. Cl. 331—101 **8 Claims**

A microwave oscillator circuit comprises an IMPATT diode connected to the inner conductor of a coaxial cable, a voltage source connected to the inner conductor for biasing the diode, and tuning elements in the cable defining a resonator resonant at a microwave frequency. A resistor is imbedded in the inner conductor closely adjacent to the diode,



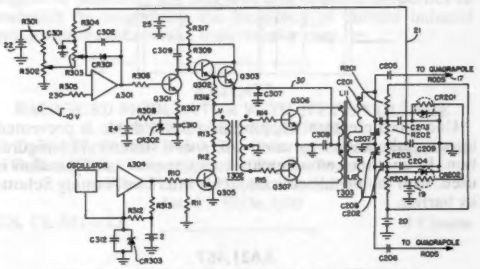
and is surrounded by an annular capacitor. Spurious low frequency oscillations are damped by the resistor, while the capacitor shunts the resistor at the output microwave frequency.

3,621,464

AMPLITUDE MODULATED RF GENERATOR FOR QUADRUPOLE MASS ANALYZER

Robert M. Bryndza, San Jose, and Fonger Wiersma, Palo Alto, both of Calif., assignors to Electronic Associates, Inc., Long Branch, N.J.

Filed Nov. 20, 1969, Ser. No. 878,315
Int. Cl. H03b 3/02
U.S. Cl. 331—106 **2 Claims**



An improved radio frequency (RF) generator for use with a quadrupole mass analyzer is disclosed wherein a ramp of RF at constant frequency is provided by developing a difference signal between the output of the circuit and a control ramp input. The error signal is modulated by the desired frequency supplied from an oscillator and amplified by a push-pull arrangement. The amplified signal is applied to a series resonant tuned circuit which directly supplies the quadrupole rods.

3,621,465

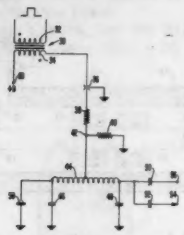
SUPERREGENERATIVE AMPLIFIER OSCILLATOR WITH TUNNEL DIODE

Charles A. Beaty, Tampa, Fla., assignor to RFD, Inc., Tampa, Fla.

Division of Ser. No. 746,492, July 22, 1968, Pat. No. 3,500,398.
Filed May 19, 1969, Ser. No. 862,542
Int. Cl. H03b 7/08
U.S. Cl. 331—107 T **2 Claims**

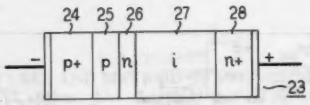
A superregenerative amplifier/oscillator having a tunnel diode as the negative resistance device, operates in the linear mode in response to a quench pulse. The tunnel diode is biased at the valley point of its forward voltage characteristic curve. The quench pulse overcomes the bias and places the tunnel diode on the negative resistance slope of its characteristic curve thereby allowing buildup of oscillations in the superregenerative amplifier/oscillator. Automatic gain control is provided by sampling the superregenerative amplifi-

er/oscillator output in response to maximum signal input, and controlling the width of the quench pulse in accordance with



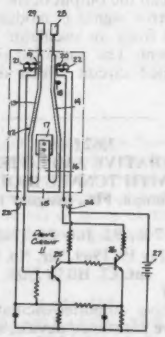
the amplitude of the superregenerative amplifier/oscillator output.

3,621,466
NEGATIVE RESISTANCE AVALANCHE DIODE STRUCTURES
Toshio Misawa, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 10, 1969, Ser. No. 883,897
Int. Cl. H03b *7/14*
U.S. Cl. 331—107 R **2 Claims**



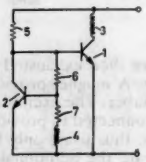
Undesired electron trapping in a Read diode is prevented in one embodiment by using a *p+pnin+* structural configuration. In another embodiment, a metal—*nin+* configuration is used, with the metal-semiconductor interface forming Schottky barrier.

3,621,467
AMPLITUDE LIMITER FOR TUNING FORK OSCILLATOR
Frank Dostal, Elmhurst, N.Y., assignor to Bulova Watch Company, Inc., New York, N.Y.
Filed Apr. 10, 1969, Ser. No. 815,083
Int. Cl. H03b *3/02, 5/30*
U.S. Cl. 331—109 **2 Claims**



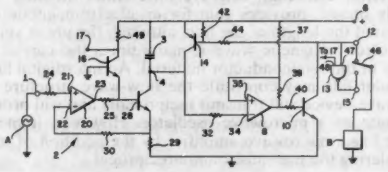
A tuning fork oscillator having a pair of tines which are sustained in vibration by an electronic drive system subject to change whereby the amplitude of fork vibration tends also to change. The amplitude is physically stabilized by mechanical stops having damping elements which are disposed to prevent the fork excursion from exceeding a preset limit, the fork being electronically driven by the system to normally exceed said limit whereby the fork amplitude neither falls below nor goes above the preset limit.

3,621,468
AMPLITUDE STABILIZED TRANSISTOR DRIVE CIRCUIT FOR MECHANICAL OSCILLATORY SYSTEM
Helmut Stechmann, Schwenningen am Neckar, Germany, assignor to Kienzle Uhrenfabriken GmbH, Schwenningen am Neckar, Germany
Filed Oct. 2, 1969, Ser. No. 863,073
Claims priority, application Germany, Oct. 5, 1968, P 18 01 444.3
Int. Cl. G04c *3/00;* **H03b** *5/30*
U.S. Cl. 331—109 **16 Claims**



An electronic circuit for driving a mechanical oscillatory system with stabilization of the amplitude of the system includes a working transistor having a working winding in its emitter-collector circuit and a control winding in its base-emitter circuit, with its working point being determined by a voltage divider having a tap connected to its base. A second transistor is provided and its emitter-circuit forms one branch of the voltage divider, with the control winding being also connected in the base-emitter circuit of the second transistor. Thereby, control signals of the control winding, effecting modulation of the working transistor, simultaneously effect modulation of the second transistor in dependence on the amplitude of the oscillatory system. The transistors may be identical or may be complementary. When the transistors are complementary, the control winding is connected between the bases of the two transistors.

3,621,469
VOLTAGE CONTROLLED OSCILLATOR
Douglas M. Bauer, Danvers, Mass., assignor to General Electric Company
Filed Aug. 21, 1969, Ser. No. 852,042
Int. Cl. H03k *3/26*
U.S. Cl. 331—111 **10 Claims**



A voltage controlled oscillator is provided in which a minimal number of switching elements are employed to produce output pulses. A current source circuit determines the charging rate of a capacitor in response to an input voltage. As the capacitor charges, the potential level at one terminal thereof, which is coupled to a comparator circuit, decreases. When this potential reaches a predetermined level, the output of the comparator circuit changes state to control a switching device which produces an output pulse. In one form of the invention, the predetermined level is determined by the input voltage. Means are coupled to the

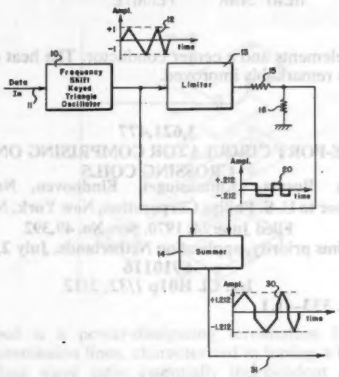
output of the comparator circuit to discharge the capacitor when the output pulse is produced.

3,621,470

LOW HARMONIC DISTORTION FSK OSCILLATOR

Steven J. Davis, Ridgefield, Conn., assignor to General Datacom Industries, Norwalk, Conn.

Filed June 5, 1970, Ser. No. 43,669
Int. Cl. H03k 5/08
U.S. Cl. 332—14 6 Claims



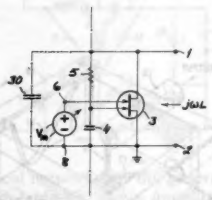
An FSK oscillator which generates extremely low second and third harmonics without the use of either passive or active filters if provided. The triangular-wave output from a frequency shift modulated triangular-wave generator is combined with a fully limited portion of the same wave to produce a stable output signal having a waveform which closely approximates that of a sinusoid.

3,621,471

RESONANT NETWORK WITH REACTIVELY COUPLED FET PROVIDING LINEAR VOLTAGE/FREQUENCY RESPONSE

Rudolf Dick, Eningen, Germany, assignor to Wandel u. Goltermann, Reutlingen, Germany

Filed Nov. 26, 1969, Ser. No. 880,116
Claims priority, application Germany, Nov. 27, 1968, P 18 11 145.0
Int. Cl. H03c 3/10
U.S. Cl. 332—16 T 9 Claims



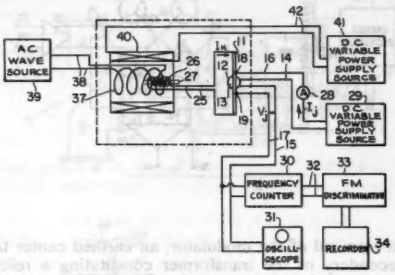
A field-effect transistor with two gates has a resistance and a reactance serially connected across its drain and source, with one gate tied to the junction of these two impedances whereas the other gate has a modulating signal applied to it. The resistance may be constituted by the output circuit of a differential transistor amplifier having its input connected in parallel with drain and source of the field-effect transistor.

3,621,472

SUPERCONDUCTING FREQUENCY CONVERTER SYSTEM

Frederick Rothwarf, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed Apr. 29, 1969, Ser. No. 820,193
Int. Cl. H03c 3/00
U.S. Cl. 332—20 11 Claims



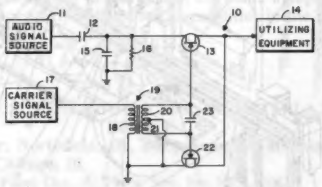
A frequency converter system for use in the superconducting range of temperature based upon the Josephson tunnelling effect, in which the detector element or device consists of a bead of lead-tin solder frozen about a fine niobium wire. A time-varying field current applied to the niobium wire produces an output signal of greatly increased frequency. This frequency converter is used to determine to a high degree of sensitivity the magnetic and resistive properties of materials by magnifying the frequency of current induced into a search coil with the material as a core.

3,621,473

BALANCED MODULATOR WITH JFET'S VOLTAGE CONTROLLED RESISTORS

C. Daniel W. Stoffer, Don Mills, Ontario, Canada, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Feb. 3, 1970, Ser. No. 8,259
Int. Cl. H03c 3/00
U.S. Cl. 332—23 4 Claims



A balanced modulator up-translating an audio input signal to carrier sidebands with the carrier suppressed in the output via two field effect transistors used as voltage controlled resistors in a series shunt configuration.

3,621,474

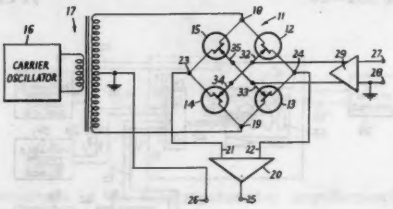
BRIDGE TYPE AMPLITUDE MODULATORS

Henryk Banasiewicz, and Frank McLean Logie, both of London, England, assignors to G. & E. Bradley Limited, London, England

Filed Oct. 23, 1969, Ser. No. 868,774
Claims priority, application Great Britain, Oct. 24, 1968, 50,574/68
Int. Cl. H03c 1/54
U.S. Cl. 332—47 9 Claims

An amplitude modulator has a bridge in which each arm consists of a field-effect transistor and one pair of opposite corners of the bridge are connected across the secondary of a transformer through which carrier oscillations are supplied. Modulating signal which may change in polarity is applied to a first differential circuit having its two outputs each of which

is connected to the gates of a respective pair of the transistors which are in diametrically opposite arms of the bridge. The other pair of opposite corners of the bridge are connected respectively to two inputs of a second differential amplifier the output terminal of which constitutes the active



output terminal of the modulator, an earthed center tap on the secondary of the transformer constituting a reference output terminal for the modulator. Amplitude modulated carrier appears at the output terminals and its phase is inverted when the polarity of the modulating signal changes. The bridge eliminates second harmonic distortion.

3,621,475

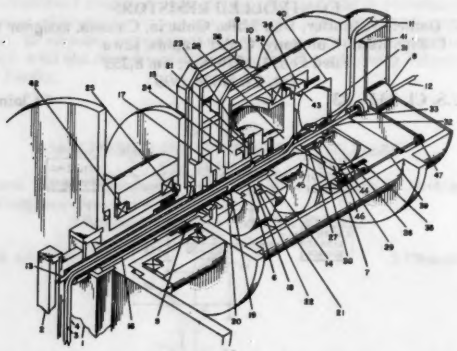
MULTICHANNEL ROTARY JOINT

Glenn A. Walters, 12900 Camino Del Valle, Poway, Calif.

Filed Jan. 7, 1970, Ser. No. 1,247

Int. Cl. H01p *1/06, 5/02*

U.S. Cl. 333—1 **3 Claims**



A multichannel microwave rotary joint composed of a tandem assembly of single channel microwave rotary joints is described wherein the single channel microwave rotary joints at each end of the assembly can be of a conventional design but the intermediate microwave rotary joints are any number of either or both of two types of single channel microwave rotary joint configurations described herein.

3,621,476

CIRCULATOR HAVING HEAT DISSIPATING PLATE

Naohiko Kanbayashi, Tokyo, Japan, assignor to TDK Electronics Company Ltd., Tokyo, Japan

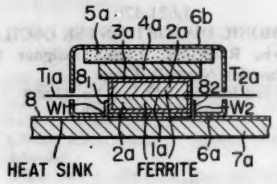
Filed Mar. 9, 1970, Ser. No. 17,816

Claims priority, application Japan, Oct. 2, 1969, 44/78800

Int. Cl. H01p *1/32, 5/12*

U.S. Cl. 333—1.1 **2 Claims**

A nonreciprocal circuit element in which some portions of a heat dissipating plate or heat sink which are introduced into a magnetic shield case through apertures thereof are made in close contact with a case which houses microwave



ferrite elements and a center conductor. The heat dissipating effect is remarkably improved.

3,621,477

THREE-PORT CIRCULATOR COMPRISING ONLY TWO CROSSING COILS

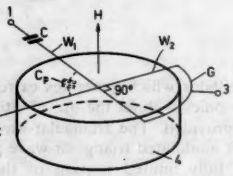
Hendrik Bosma, Emmasingel, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed June 24, 1970, Ser. No. 49,392

Claims priority, application Netherlands, July 2, 1969, 6910116

Int. Cl. H01p *1/32, 5/12*

U.S. Cl. 333—1.1 **1 Claim**



Three-port circulator comprising only two windings crossing each other at right angles so that the number of stray capacitances as compared with existing circulators is reduced and the bandwidth is less restricted.

3,621,478

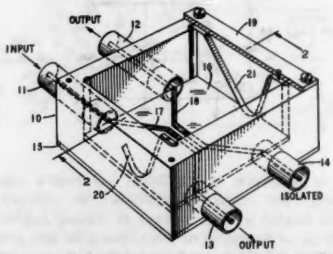
SUSPENDED SUBSTRATE TRANSMISSION LINES HAVING COUPLED CENTER CONDUCTORS

Arlen Kent Johnson, New Providence, and George Isaac Zysman, Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 13, 1970, Ser. No. 27,501

Int. Cl. H01p *5/14*

U.S. Cl. 333—10 **2 Claims**



A structure is disclosed having parallel center conductors on a substrate suspended in an offset manner between a pair of ground plane conductors. Offsetting the substrate in the manner taught results in equalizing the phase velocities of the even and odd mode portions of electromagnetic energy cou-

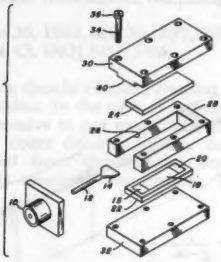
pled from one of the center conductors to the other center conductor.

3,621,479

APPARATUS FOR DISSIPATING WAVE ENERGY

Noel C. Peterson, Severna Park, Md., and Gerald I. Klein, Westbury, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1970, Ser. No. 1,353
Int. Cl. H01p 1/26
U.S. Cl. 333—22 R 8 Claims



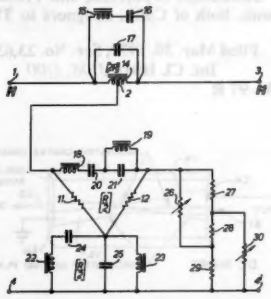
Described is a power-dissipating termination for wave energy transmission lines, characterized in having a low voltage standing wave ratio essentially independent of input power and operable in ambient temperatures up to 300° C. over a frequency range from zero to ultrahigh frequencies and above.

3,621,480

ELECTRICAL NETWORKS

John David Brownlie, Chesham, England, assignor to The Post Office, London, England

Filed Feb. 11, 1970, Ser. No. 10,417
Claims priority, application Great Britain, Feb. 14, 1969, 8,217/69
Int. Cl. H03h 5/00
U.S. Cl. 333—28 10 Claims



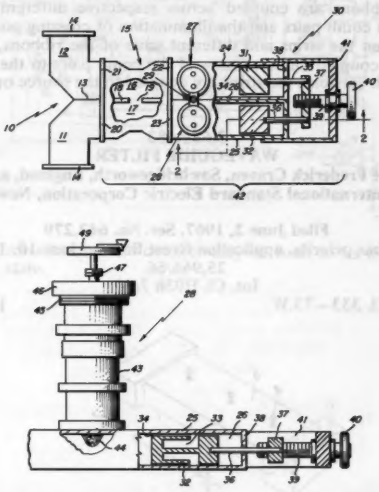
Passive electrical networks for the generation of even- and odd-echo-pairs suitable for use in annulling gain and phase inequalities in color television signals are described. The networks are of the bridged-T-type. A center-tapped inductor forms the horizontal bar of the "T" and an echo-generating circuit forms the vertical bar. The bridging network contains components which with the shunt inductance and self-capacitance of the inductor form a fourth order approximation to a delay line. Values are chosen so that the inductor has a hybrid coupling action. Compensation for leakage inductance of the inductor consists of introducing delays into the echo-generating circuit and delay circuit. Adjustment of the networks and modifications to the echo-generating circuit are described.

3,621,481

MICROWAVE ENERGY PHASE SHIFTER

Henry W. Perreault, Chelmsford, and Howard Scharfman, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 1, 1970, Ser. No. 33,742
Int. Cl. H03h 7/22
U.S. Cl. 333—31 7 Claims



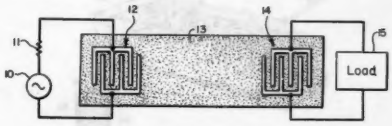
Means for control of amplitude, as well as phase, of electromagnetic energy in microwave frequency transmission systems are disclosed incorporating variable energy reflection, as well as absorption load means, in a compact branch transmission line structure coupled by short-slot hybrid junction means to a main transmission line. Adjustment of the load-to-line coupling results in variation of the amplitude of the energy and variation of a terminal reflecting member results in adjustment of the phase of such energy. The adjustments in amplitude, as well as phase, are made independently and have exceedingly high power capabilities in the order of megawatts.

3,621,482

TUNABLE SURFACE-WAVE SIGNAL-TRANSLATING DEVICE

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 4, 1969, Ser. No. 882,238
Int. Cl. H03h 9/30, 7/10
U.S. Cl. 333—72 9 Claims



A filter has an acoustic-surface-wave propagating medium, a source and/or load for translating signals of different frequencies within a given range and a plurality of pairs of interleaved conductive combs formed on a surface of the medium with each comb pair having a unique intertooth spacing such that the comb pairs individually respond to different assigned frequencies within the range. The structure includes a plurality of conductive ribbons that are laterally spaced successively apart across a portion of the medium and a pair of

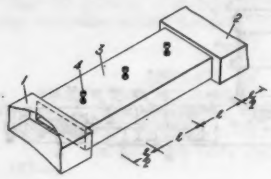
conductive strips oriented generally transverse to the ribbons is coupled across the source or load. Sandwiched between the strips and ribbons is a layer of photoconductive material. A light source illuminates at least two discrete regions of the photoconductive layer disposed individually on respective different ones of the strips in alignment with respective different ones of the ribbons. In one version, the illuminated regions each overlie respective different groups of ribbons with those different groups together then serving as the teeth of the interleaved combs. In another version, different pairs of the ribbons are coupled across respective different interleaved comb pairs and the illumination of crossing points, as between the strips and different pairs of the ribbons, selectively coupled different ones of the comb pairs to the strips. In both versions, the strips are coupled to the source or load.

3,621,483

WAVEGUIDE FILTER

George Frederick Craven, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 2, 1967, Ser. No. 643,279
Claims priority, application Great Britain, June 10, 1966, 25,966/66
Int. Cl. H03h *7/10*
U.S. Cl. 333—73 W **1 Claim**



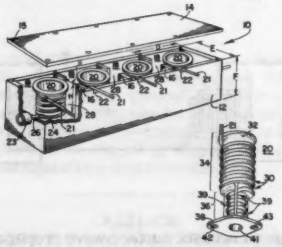
Waveguide band-pass filters operated such that only evanescent H waves exist at the operating frequency of the system are terminated in a capacitive reactance which at the center frequency of the desired pass band is the conjugate of the positive imaginary characteristic impedance of the length of evanescent waveguide. The capacitive termination is the only obstacle required in the guide.

3,621,484

HELICAL RESONATOR HAVING VARIABLE CAPACITOR WHICH INCLUDES WINDINGS OF REDUCED DIAMETER AS ONE PLATE THEREOF

Dale L. Shult, Mount Prospect, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 5, 1970, Ser. No. 16,903
Int. Cl. H10s ; H03h *7/10*
U.S. Cl. 333—83 R **8 Claims**



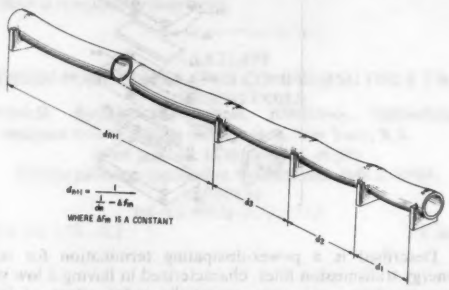
A helical resonator is comprised of a coil embedded in a plastic core which has been injection molded thereabout and a conductive housing. Windings at one end of the coil have a reduced diameter with respect to the diameter of the rest of the windings of the coil to provide one plate of an equivalent variable capacitor. The other plate is partially formed by a wall of the housing which is adjacent to the windings of reduced diameter. A screw extends through the foregoing wall into a hollow portion in the core enclosed by the windings of reduced diameter. Adjustment of the screw controls the resonant frequency of the cavity.

3,621,485

WAVEGUIDE SUPPORT SYSTEM

Robert P. Guenther, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1969, Ser. No. 885,418
Int. Cl. H01p *3/12, 1/00;* **H02g** *7/14*
U.S. Cl. 333—95 **4 Claims**



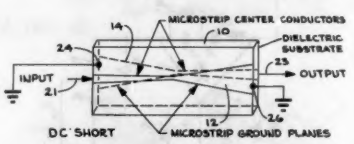
A system is disclosed for supporting a circular waveguide to minimize transmission losses caused by mode coupling resulting from the deflection of the waveguide due to its own weight between the supports. The conventional system of spacing the supports at regular linear intervals is replaced by this system which provides supports at varying linear intervals. The linear intervals vary to provide a uniform change in mechanical frequency (the inverse of linear spacing).

3,621,486

DIRECT CURRENT SHORT CIRCUIT DEVICE

Bernard F. Gunshinan, Sepulveda, and Frederick W. Hand, Jr., Burbank, both of Calif., assignors to The Bendix Corporation

Filed Mar. 30, 1970, Ser. No. 23,636
Int. Cl. H01p *3/08, 1/00*
U.S. Cl. 333—97 R **3 Claims**



A miniature microstrip device is described which constitutes a highly effective direct current short circuit device while retaining the ability to transmit a very wide range of frequencies above the cutoff frequency. Each of two printed circuit conductor patterns is positioned on opposite faces of a dielectric substrate. Each conductor has a wide, but tapered, ground plane conductor connecting to a smoothly tapered "hot side" conductor track tapered such as according to a Tchebycheff pattern. These conductors are reversibly aligned on the substrate such that each "hot side" conductor is associated with the ground plane portion of the op-

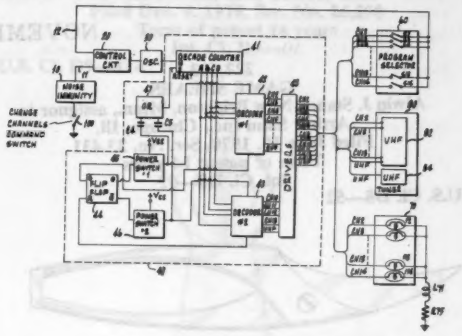
posite conductor. Each end is adapted to be connected to a conventional microwave coaxial line with the ground plane portion of one printed conductor connected to the shielding portion and the "hot side" end of the opposite conductor connected to the center conductor of the coaxial line. Thus, each center, conductor is connected through the printed circuit conductor to a grounded portion of the opposite connector, thus grounding all direct current. The microwave frequencies, of course, are transmitted from the input lead across the substrate to the opposite center conductor.

3,621,487
SEQUENCER

Don Edward Christensen, Indianapolis, Ind., assignor to RCA Corporation

Filed June 30, 1969, Ser. No. 837,507
Int. Cl. H03j *3/04, 3/06*
U.S. Cl. 334—11 **10 Claims**

A counter, such as a decade counter, coupled to a plurality, such as two, decoders. In the case of a decade counter, each decoder is responsive to not more than ten counts. In response to the last count decoded by one decoder, it is operatively decoupled from the decoder and the next decoder is operatively coupled to the counter. This may be accomplished, for example, by removing power from one decoder and applying it to the other. In addition, in response to this same stimulus, the counter may be reset to its initial counting state.

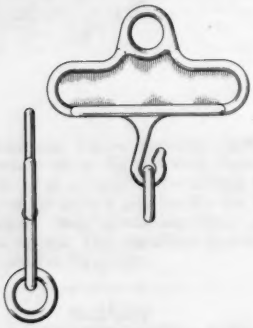


DESIGNS

NOVEMBER 16, 1971

222,603
GAME SHEARS
Alwin J. Stabel, New Brighton, Minn., assignor to Arthur Salm Inc., Chicago, Ill.
Filed June 10, 1970, Ser. No. 23,431
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—52

222,604
GARMENT HANGER CARRIER
Charles H. Borten, Kyoto Bldg., Suite 1–U, Towers of Windsor Park, Cherry Hill, N.J. 08034
Filed May 19, 1970, Ser. No. 23,055
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—15 A

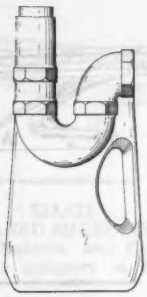


222,605
JUG
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1970, Ser. No. 26,280
Term of patent 14 years
Int. Cl. D9—*40*
U.S. Cl. D9—40

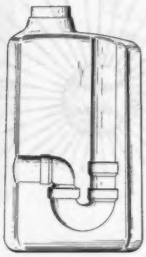
222,606
JUG
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1970, Ser. No. 26,291
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

222,607
JUG
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1970, Ser. No. 26,283
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—42

222,608
JUG
George N. Grosshans, Los Angeles, Calif., and Raymon E. Hobbs, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 22, 1970, Ser. No. 26,621
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—42

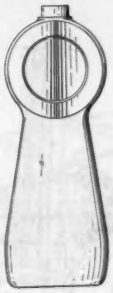


222,609
BOTTLE
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1970, Ser. No. 26,284
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—70



222,610
BOTTLE
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1970, Ser. No. 26,289
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137

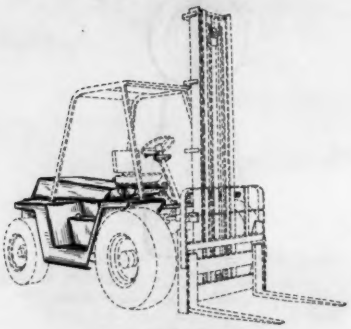
222,611
BOTTLE
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 4, 1970, Ser. No. 26,290
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116



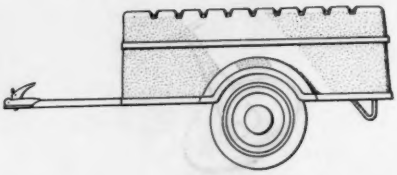
222,612
COMBINED POUR SPOUT AND HANGER FOR A CONTAINER
Joseph Marg, 24043 Greenlawn Ave., Beachwood, Ohio 44121
Original design application Feb. 5, 1969, Ser. No. 15,640. Divided and this application Nov. 13, 1970, Ser. No. 25,955
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—290

222,613
COMBINED POUR SPOUT AND HANGER FOR A CONTAINER
Joseph Marg, 24043 Greenlawn Ave., Beachwood, Ohio 44121
Original design application Feb. 5, 1969, Ser. No. 15,640. Divided and this application Nov. 16, 1970, Ser. No. 25,980
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—290

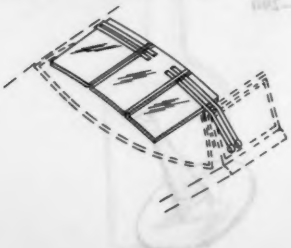
222,614
LIFT TRUCK BODY
Warner K. Brown, 111 Shadywood Lane, Battle Creek, Mich. 49015, and Darrell C. Fuller, 1602 Orchard Lane, Marshall, Mich. 49068
Continuation-in-part of design application Ser. No. 18,756, Aug. 19, 1969. This application June 10, 1970, Ser. No. 23,433
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D14—3



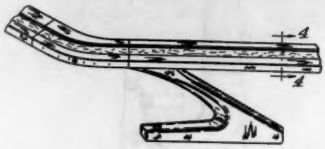
222,615
TRAILER
Horst R. Hickmann, Cincinnati, Ohio, assignor to Joseph V. Wilson, Cincinnati, Ohio
Filed Sept. 30, 1970, Ser. No. 25,277
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3



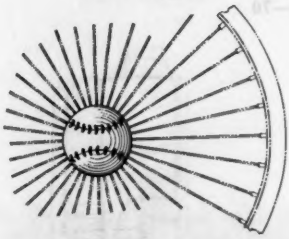
222,616
AUTOMOBILE RAIN VISOR FOR DRIVE-IN THEATRES
John P. Francis, 20 Boston St., Haverhill, Mass. 01830
Continuation-in-part of design application Ser. No. 19,923, Nov. 4, 1969. This application Aug. 12, 1970, Ser. No. 24,438
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



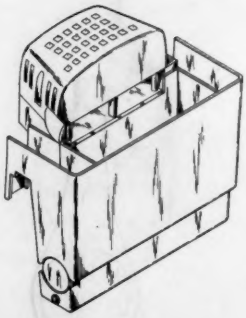
222,617
LUGGAGE RACK
John A. Bott, 931 Lake Shore Drive, Grosse Pointe Shores, Mich. 48236
Filed Apr. 16, 1970, Ser. No. 22,456
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—27



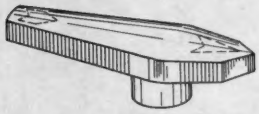
222,618
CYCLE WHEEL ORNAMENT OR THE LIKE
Donald O. Ascani, 510 Miller St., and Joseph R. Ascani, 451 Broadway, both of Bangor, Pa. 18013
Filed Feb. 25, 1969, Ser. No. 15,908
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30



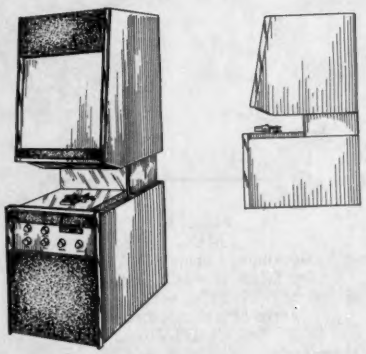
222,619
COMBINED FILTER AND PUMP FOR AQUARIUMS
David D. Lovitz, Short Hills, N.J., assignor to Sternco Industries, Inc., Harrison, N.J.
Filed Aug. 21, 1970, Ser. No. 24,631
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



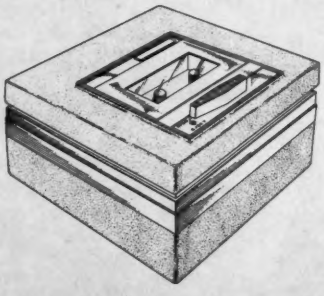
222,620
VALVE OPERATING HANDLE
Francis J. Callahan, Jr., Chagrin Falls, Ohio, and Stephon Matousek, Moraga, Calif., assignors to Whitey Research Tool Co., Emeryville, Calif.
Filed May 13, 1970, Ser. No. 22,963
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29



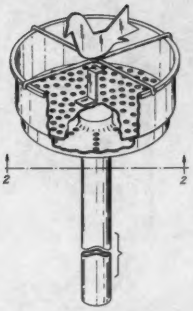
222,621
INFRARED MICROSCOPE
Bennett Sherman, Elmhurst, and Gerard J. Spillman, Floral Park, N.Y., assignors to GTE Laboratories Incorporated
Filed May 28, 1970, Ser. No. 23,195
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D26—5



222,622
CASSETTE TRANSPORT
Leon C. Sanderson, Culver City, and David R. Crouch, Los Angeles, Calif., assignors to Ampex Corporation, Redwood City, Calif.
Filed Oct. 16, 1970, Ser. No. 25,524
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



222,623
COMBINED BIRD FEEDER AND WASTE FOOD DRIER
Idolee Simpson, 7631 Jerome Ave., Maplewood, Mo. 63143
Filed June 10, 1970, Ser. No. 23,427
Term of patent 7 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



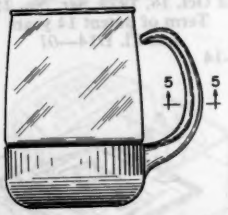
222,624
TABLE
John L. Gianfagna, 102 Crestwood Circle, Marietta, Ohio 45750
Original design application July 17, 1968, Ser. No. 12,808. Divided and this application May 13, 1969, Ser. No. 19,396
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14

222,625
COIN BANK OR SIMILAR ARTICLE
Irwin Cohn, 746 West St., Leominster, Mass. 01453
Filed Nov. 9, 1970, Ser. No. 25,875
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—11

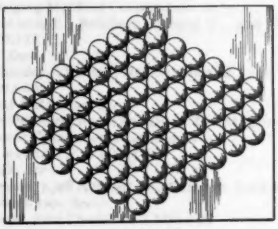
222,626
COIN BANK OR SIMILAR ARTICLE
Irwin Cohn, 746 West St., Leominster, Mass. 01453
Filed Nov. 9, 1970, Ser. No. 25,876
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—11

222,627
COIN BANK OR SIMILAR ARTICLE
Irwin Cohn, 746 West St., Leominster, Mass. 01453
Filed Nov. 9, 1970, Ser. No. 25,877
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—11

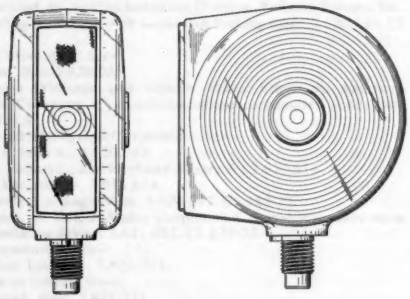
222,628
MUG
Glenn B. Beckman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Apr. 27, 1970, Ser. No. 22,673
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—9



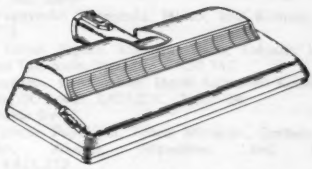
222,629
KINETIC SCREEN OR SIMILAR ARTICLE
Jon Hassell, New York, N.Y., assignor to Light Years Inc., New York, N.Y.
Filed Feb. 9, 1970, Ser. No. 21,323
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—16



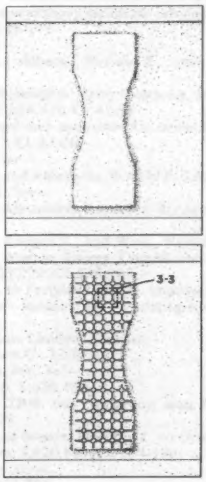
222,630
COMBINED PARK, TURN SIGNAL AND SIDE MARKER LIGHT
Robert E. Dawson, Huntingdon Valley, Pa., and Edward J. Nitsch, Camillus, and John F. Stahl, Syracuse, N.Y., assignors to R. E. Dietz Company, Syracuse, N.Y.
Continuation-in-part of design application Ser. No. 13,186, Aug. 19, 1968. This application Mar. 10, 1969, Ser. No. 16,551
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D48—32



222,631
VACUUM CLEANER ACCESSORY NOZZLE
Paul E. Gaudry, 40 Ouimet St., Laval des Rapides, Laval, Quebec, Canada
Filed June 18, 1970, Ser. No. 23,558
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D49—19



222,632
DISPOSABLE DIAPERS
Evelyn H. Krusko, Philadelphia, Pa., assignor to Scott Paper Company, Delaware County, Pa.
Filed Mar. 30, 1970, Ser. No. 22,125
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF NOVEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

3 Atkins, Jack: *See—*
Parkinson, Norman; Blakely, Christine Mary; and Russell, Robert Francis, 3,620,366.

% Prentice Hall Corporation System, Inc.: *See—*
Hannes, George John, 3,620,906.

A-B-C Packaging Machine Corporation: *See—*
Neal, Morris P.; Reichert, Donald G., and Fradenburgh, John, 3,620,138.

A-T-O Inc.: *See—*
Hwoschinsky, Vladimir; Nelson, James E.; and Westcott, Paul W., 3,620,683.

AB Akerlund & Rausing: *See—*
Benzon-Petersen, Boye; and Dilot, Rolf Magnus, 3,620,871.

A.B. Electronic Components Limited: *See—*
Bridle, Kenneth F., 3,621,449.

AB Tetra Pak: *See—*
Martensson, Kjell Halvard; and Karlsson, Lars Anders, 3,619,979.

Abbott Laboratories: *See—*
Szymanski, Earl Thaddeus, 3,620,216.

Abbott, Randle L.; and Green, Paul C., to GKN Birfield Transmissions Limited. Variable gears. 3,620,101, Cl. 74-691.

Abe, Shigeo; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Process for producing inosine. 3,620,922, Cl. 195-28.

Abe, Shigeo; Furuya, Akira; and Okachi, Ryo, to Kyowa Hakko Kogyo Co., Ltd.Process for producing 5'-inosinic acid and 5'-guanylic acid nucleotides. 3,620,921, Cl. 195-28.

Abe, Tamio: *See—*
Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio,3,621,087.

Abealter, Duane R., to Travel Accessories Manufacturing Company, Inc. Spare tire carrier. 3,620,396, Cl. 214-454.

Abrahams, Jacobus Hubertus: *See—*
Jaspers, Hendrik Alphons; and Abrahams, Jacobus Hubertus,3,620,652.

A.C.B. Corporation: *See—*
Hitchcock, Arthur A., 3,621,163.

Accessory Specialties, Inc.: *See—*
Grasso, Joseph C., 3,620,404.

A.C.I. Operations Pty, Limited: *See—*
Corderoy, Henry Morgan, 3,620,187.

Adam, Herbert Alexander. Inflatable canopy for outdoor areas. 3,619,957, Cl. 52-2.

Adams, Andrew O.; and Capol, Roman J., to Leach Corporation, mesne. Polarized latch relay. 3,621,419, Cl. 335-230.

Adams, Bertram C. Printed circuit board. 3,621,116, Cl. 174-68.5

Adams, Leonard, Jr., to Finn Industries Division, Potlatch Forests, Inc., The. Folding carton top with sequential locking flaps. 3,620,436, Cl. 229-39.

Adcotech Corporation: *See—*
Stillman, Ben, 3,620,255.

Addor, Roger Williams; and Allman, David Edgar, to American Cyanamid Company. Cyanoalkylaldoxime carbamates. 3,621,049, Cl. 260-465.4

Addressograph-Multigraph Corporation: *See—*
Deutsch, Fritz A., 3,620,343.
Gunto, Robert L.; and Mathisen, Henry A., 3,620,614.
VanAcker, John J., 3,620,624.

Adkins, Orville. Cooling system. 3,620,297, Cl. 165-23.

Adler, Robert, to Zenith Radio Corporation. Tunable surface-wave signal translating device. 3,621,482, Cl. 233-72.

Admiral Corporation: *See—*
Lewinson, Lothar J., 3,621,318.

AEG-Elotherm GmbH: *See—*
Von Starck, Axel, 3,621,311.

Aerojet-General Corporation: *See—*
Binnings, Gerald F., 3,620,596.
Grakauskas, Vytautas, 3,620,688.

Agfa-Gevaert Aktiengesellschaft: *See—*
Engelsmann, Dieter; and Pawlik, Gunter, 3,620,142.
Riedel, Anton; and Nissl, Max, 3,620,469.
Riester, Oskar, 3,620,750.

Ahmann, John E., to Computer Electron Systems, Inc. Portable self-contained voting booth. 3,620,587, Cl. 312-223.

Ahramjian, Leo, to Du Pont de Nemours, E. I., and Company. Optically clear thermoplastic polyurethanes. 3,620,905, Cl. 161-190.

Aileo, Jackson Anthony, to Gentex Corporation. Protective helmet with adjustable headband. 3,619,814, Cl. 2-3.

Air Products and Chemicals Inc.: *See—*
Erby, William A.; and Walde, Robert A., 3,619,991.
Longsworth, Ralph C., 3,620,029.

Air Reduction Company, Incorporated: *See—*
Geiger, Lewis J., Jr., 3,620,514.

Airtex Product Div., United Industrial Syndicate: *See—*
Gray, Robert J., 3,620,042.

Ajinomoto Co., Inc.: *See—*
Kitada, Nagayoshi; Shimazaki, Hideo; and Komata, Yasushi, 3,620,772.
Yoshida, Teruo; Sagara, Takaaki; Ojima, Takashi; Takahashi, Reiji; and Takahashi, Masahiro, 3,620,762.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. System for controlling DC power. 3,621,270, Cl. 307-24.

Akatsu, Mitsuharu: *See—*
Hirota, Ryoichi; Fujishima, Tohru; Miyazaki, Gentaro; Iwasaki, Tadahiko; Akatsu, Mitsuharu; and Kinoshita, Tomoo,3,621,123.

AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See—*
Gorike, Rudolf; and Kollesberger, Wilhelm, 3,621,420.

Aktiebolaget Astra: *See—*
Bamberg, Peter; Ekstrom, Bertil Ake; and Sjoberg, Berndt Olof Harald, 3,621,029.

Aktiebolaget Bofors: *See—*
Davidsson, Per-Olof; and Hogberg, Karl Gosta, 3,620,123.
Soderberg, John Lennart; Back, Jarl Sigurd; and Hakansson, Christer Lennart, 3,620,857.

Aktiebolaget Gotaverken: *See—*
Lundberg, Thorsten Ingvar Egon, 3,620,521.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Von Willisen, Friedrick K., 3,621,390.

Akuta, Tomohiko; Honsyo, Yoshio; and Hashirizaki, Shinya, to Yawata Iron & Steel Co. Ltd. Method and apparatus for measuring the lengths of objects being conveyed. 3,621,266, Cl. 250-219.

Alarm Products International, Inc.: *See—*
Halaby, Josef E., 3,621,417.

Albers, Francis L.: *See—*
Barrett, Allan G.; and Albers, Francis L.,3,620,072.

Albrecht, Arthur B. Demonstrator finger ring. 3,619,913, Cl. 35-53.

Albright & Wilson Limited: *See—*
Henley, Eric Douglas; and Walker, George Eden, 3,620,334.

Albright, Thomas M.; and Barton, James S., to Caterpillar Tractor Company. Crankcase ventilating means for submerged engine operation. 3,620,197, Cl. 123-119.

Alburn, Harvey E.: *See—*
Russell, Peter B.; Alburn, Harvey E.; and Grant, Norman H.,3,621,011.

Alday, James M., to Remington Arms Company, Inc. Bolt actuated ejection port cover. 3,619,926, Cl. 42-16.

Alduk, Frank P. Method and apparatus for nesint bottles and other containers. 3,619,967, Cl. 53-26.

Alexander, Donald E.: *See—*
Kress, Bernard H.; and Alexander, Donald E.,3,620,290.

Alexander, Raymond B.: *See—*
Kelley, Louis E.; Alexander, Raymond B.; and Sioma, Edward M.,3,620,071.

Alexeff, Igor; Neidigh, Rodger V.; and Wing, William Ray, to United States of America, Atomic Energy Commisson. High frequency signal correlator. 3,621,223, Cl. 235-181.

Alford, Derek William, to Ferranti Limited. Improvements relating to resilient suspension means for vibrating-rotor gyroscopes. 3,620,088, Cl. 74-5.

Algoma Steel Corporation, Limited, The: *See—*
Donnithorne, William C., 3,620,363.

All American Industries, Inc.: *See—*
Riblett, Harry C., Jr., 3,620,489.

Allen, Clifford H., to TRW Inc. Tangency seals for compressors. 3,620,654, Cl. 418-129.

Allen, Robert Carter; and Moore, Dorothy J., to Ortec, Incorporated. Electrophoretic system. 3,620,947, Cl. 204-180.

Allen-Bradley Company: *See—*
Callan, John E., 3,621,295.
Racht, Willis J.; and Pfister, Paul, 3,621,442.

Allied Chemical Corporation: *See—*
Eckardt, Carl R.; Barton, Oliver Alfred; and Hetterly, Ralph Milton, 3,620,860.
Lenz, Robert W.; Barish, Leo; and Lyons, Virginia L., 3,620,666.
Li, Hsin Lang; Prevorsek, Dusan C.; and Oswald, Hendrikus Johan, 3,619,874.
Winckllhofer, Robert C.; Weedon, Gene C.; and Collingwood, George H., 3,620,892.

Allman, David Edgar: *See—*
Addor, Roger Williams; and Allman, David Edgar,3,621,049.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Dalmo, Bror; Franked, John; Landhult, Hans; Nordberg, Birger; Ronnevig, Carl; and Tjernstrom, Ove, 3,621,315.
Nilsson, Jan, 3,620,059.

Allport, Maurice James: *See—*
Wiley, David; and Allport, Maurice James,3,621,360.

Allstar Verbrauchsguter GmbH & Co., KG: *See—*
Krusche, Kurt; and Zimmermann, Hubert, 3,619,846.

Alphanumeric, Incorporated: *See—*
Manber, Solomon, 3,621,137.

Aluminum Company of America: *See—*
Hess, Paul D., 3,620,716.

AMBAC Industries, Incorporated: *See—*
Stephens, Joe B.; and Ashcraft, Joel N., 3,620,200.

American Cyanamid Company: *See—*
Addor, Roger Williams; and Allman, David Edgar, 3,621,049.
Miller, Bernard; and English, Jackson Pollard, 3,621,021.
Padmanathan, Thurairajah, 3,621,023.
Richter, Ferdinand Joseph; and Messer, Philip Joseph, 3,619,843.
Schmitt, Edward Emil; and Polistina, Rocco Albert, 3,620,218.
Wasser, Richard Barkman, 3,620,991.
Wetzstein, Hanns J., 3,621,250.

American Guidance Service, Inc.: *See—*
Woodcock, Richard W.; and Yackel, John P., 3,620,552.

American Hoist & Derrick Company: *See—*
Brown, Archer W.; Montgomery, James L.; and Erkenbrack, Lorraine V., 3,620,579.

American Home Products Corporation: *See—*
Russell, Peter B.; Alburn, Harvey E.; and Grant, Norman H., 3,621,011.

American Metal Climax, Inc.: *See—*
Crocker, Thomas H., 3,619,946.
Klein, Richard, 3,620,014.

American Optical Corporation: *See—*
Cuff, David W., 3,621,457.
Tackaberry, Robert B., 3,620,593.

American Optic1 Corporation: *See—*
Young, Charles Gilbert, 3,621,181.

American Packaging Corporation: *See—*
Watts, Ridley, Jr., 3,621,200.

AMF Corporated: *See—*
Bell, Richard E., 3,621,415.

AMP Incorporated: *See—*
Clifford, John E., 3,620,843.
Geckle, Raymond James; and Wilt, Larry John, 3,620,839.

Ampex Corporation: *See—*
Matley, Joseph Brian, 3,621,353.

Anaconda Wire and Cable Company: *See—*
Bunish, Steve; Wilson, Floyd A.; and Hansen, Theodore E. 3,621,118.
Hubbard, Ronald R.; and Blumenfeld, Klaus H., 3,620,471.
Snyder, Clermont J.; and Moore, Jack P., 3,620,853.

Anaren Microwave, Incorporated: *See—*
Paciorek, Leonard J.; and Gerst, Carl W., 3,621,400.

Ancra Corporation: *See—*
Brenia, Paul S.; and Prete, Ernest, Jr., 3,620,171.

Andersen, Charles Martinus Bech. Safety closure. 3,620,398, Cl. 215-9.

Andersen, John H. Golf cart with club rack foldable by cart handle. 3,620,546, Cl. 280-40.

Anderson, George J.: *See—*
Dahms, Ronald H.; and Anderson, George J.,3,620,908.

Anderson, George J.; and Dahms, Ronald H., to Monsanto Company. Laminates prepared fom C_8-C_10 substituted phenol- formaldehyde resins. 3,620,902, Cl. 161-165.

Anderson, Gerald R., to FMC Corporation. Fruit aligning apparatus. 3,620,274, Cl. 146-52.

Anderson, Karl F.; and Lynch, Thomas L., to United States of America, National Aeronautics and Space Administration. Pulsed excitation voltage circuit for transducers. 3,621,285, Cl. 307-237.

Anderson, Raymond V.: *See—*
Economy, James; and Anderson, Raymond V.,3,620,780.

Anderson, Richard W.; and Merrill, Claude I., to Dow Chemical Company, The. Substituted halocycloalkenes. 3,621,066, Cl. 260-611.

Anderson, Robert E., to Mueller Color Plate Company. Method of making electrotype printing plates. 3,620,877, Cl. 156-285.

Anderson, William J.; and Coe, Harold H., to United States of America, National Aeronautics and Space Administration. High speed rolling element bearing. 3,620,585, Cl. 308-195.

Ando, Satoshi: *See—*
Tamura, Yoshio; and Ando, Satoshi,3,620,904.

Andres, Rudolf: *See—*
Breitschwerdt, Werner; and Andres, Rudolf,3,620,198.

Angerer, Dell Y.: *See—*
Wilson, Jean B.; and Angerer, Dell Y.,3,620,570.

Angermeyer, Wolfgang, to Desco-Werk Seger & Angermeyer KG. Cable reel with means for guarding against overheating of convoluted cable. 3,621,336, Cl. 317-40.

Angus, George, & Company Limited: *See—*
Jagger, Ernest T.; Halliday, Geoffrey W.; and Harrison, Frank, 3,620,540.

Annas, Robert F.; and Hinsberger, Vincent, to Paramount Health Equipment Corporation. Sacroiliac rotator. 3,620,210, Cl. 128-74.

Antas, Stanley Casimir; Genneken, George Thomas; and Smith, Donald Tolman, to Bell Telephone Laboratories, Incorporated. Wrapped insulation-piercing connector. 3,621,117, Cl. 174-84.

Anthony, Donald R.: *See—*
Hinds, Fred C.; and Anthony, Donald R.,3,620,555.

API Corporation: *See—*
Flicker, Howard D.,,362,080.

Appleton, Arthur I. Resilient lighting fixture hanger. 3,621,235, Cl. 240-90.

Application Des Gaz: *See—*
Laurent, Jacques, 3,620,660.
Vial, Michel, 3,620,205.

Applied Laser Technology, Incorporated: *See—*
Barker, Ronald C., 3,620,590.

Aquanox, Inc.: *See—*
Valdespino, Joe M., 3,620,371.

Arai, Takuya: *See—*
Fugiwara, Hirotomo; Arai, Takuya; and Miyamoto, Noboru,3,620,361.

Aramasow, Waldemar; Muller, Helmut; and Lindenthal, Hans, to Voith Getriebe KG. Steering drive for track-laying vehicles. 3,620,319, Cl. 180-6.44

Archer, Sydney; and Lorenz, Roman R., to Sterling Drug Inc. 2-(8-Cyclohexyloctanoyl or 7-cyclohexylheptanoyl)- 1-naphthol. 3,621,062, Cl. 260-590.

Arco Industries Corporation: *See—*
Longcore, Lawrence A., 3,620,510.

Arell, Elmo R.: *See—*
Iles, Kenneth E.; Jung, Harry J.; and Arell, Elmo R.,3,620,526.

Arens, Alfred: *See—*
Wagner, Otto; Bauer, Klaus; Kaufmann, Wilfried; Rauenbusch, Erich; Arens, Alfred; and Irion, Eckart,3,620,926.

Arima, Hideki: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Mashiro; and Arima, Hideki,3,621,058.

ARINC Research Corporation: *See—*
Gantschnigg, Gottfried K., 3,620,043.

Ariyan, Zaven S.; and Martin, Robert L., to Uniroyal, Inc. Tricyclic polysulfur compounds and process for their preparation. 3,621,032, Cl. 260-327.

Armasow, Waldemar, to Voith Getriebe KG. Steering drive for track laying vehicles. 3,620,320, Cl. 180-6.44

Armstrong Cork Company: *See—*
Poshkus, Algirdas C., 3,620,672.

Arnegard, Bo Olof Roland, to Atlas Copco Aktiebolag. Balanced rotor machine. 3,620,655, Cl. 418-151.

Arnold, Bruce K.; and Paugh, Edward C., to International Telephone and Telegraph Corporation. Accordian seal for electrical connectors. 3,621,448, Cl. 339-94.

Arsandaux, Louis: *See—*
Faure, Marc; and Arsandaux, Louis,3,620,325.

Arsandux, Marthe Marie Louis: *See—*
Faure, Marc; and Arsandaux, Louis,3,620,325.

Artisan Industries Inc.: *See—*
Brown, Francis Charles, 3,620,283.

Artman, Neil R.: *See—*
Strobel, Rudolf G. K.; and Artman, Neil R.,3,620,756.

Asakura, Yukio: *See—*
Kanemitsu, Tsunetoshi; and Asakura, Yukio,3,620,754.

Asano, Nobuyuki: *See—*
Matsummura, Shigeru; Asano, Nobuyuki; and Kawaguchi, Munetaka,3,620,996.

Ashcraft, Joel N.: *See—*
Stephens, Joe B.; and Ashcraft, Joel N.,3,620,200.

Ashkin, Arthur, to Bell Telephone Laboratories, Incorporated. Nonpolartzing wire grid diffraction type optical attenuator. 3,620,599, Cl. 350-162.

Ataka, Hisanori; and Ikezu, Yohei, to Kabushiki Kaisha Ricoh. Photometric device for photometering within a polomirror body for use with a single-lens reflex camera. 3,620,147, Cl. 95-42.

Atkins, Jack. Filter constructed of metallic material. 3,620,375, Cl. 210-484.

Atkinson, Cyril M., to Northrop Weaving Machinery Limited. Cloth roller drives for looms. 3,620,262, Cl. 139-307.

Atlantic Richfield Company: *See—*
Hamersma, Joseph Warren, 3,621,067.
Haney, Stanley C.; and Cimbalo, Robert N., 3,620,966.
Hinds, Fred C.; and Anthony, Donald R., 3,620,555.
Pfefferle, William C., 3,620,962.
Riggs, Emmet D., 3,620,591.
Wunderlich, Donald K,; Carleton, Finis E.; and Brownscombe, Eugene R., 3,620,697.

Atlas Copco AB: *See—*
Tegholm Ruben Valdemar, 3,620,625.

Atlas Copco Aktiebolag: *See—*
Arnegard, Bo Olof Roland, 3,620,655.
Lundgren, Karl Ivar, 3,619,904.

Atomic Energy of Canada Limited: *See—*
McPherson, Neil Freeman; and Hanssmann, Nils, 3,621,177.

Atwood Vacuum Machine Company: *See—*
Korab, George, 3,620,495.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Reinhardt, Gerd; Heide, Horst; and Flinspach, Sebastian, 3,620,511.

Aumuller, Walter: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut,3,621,057.
Automated Building Components, Inc.: *See—*
Jureit, John C.; Csakvary, Oscar; Castillo, Adolfo; Kushner, Benjamin H.; and Karch, Otto J., 3,620,270.
Automatic Marketing Industries, Inc.: *See—*
Bixby, George, Jr., 3,620,155.
Automatic Timing & Controls, Inc.: *See—*
Houpt, Grover K., 3,621,304.
Automation Industries, Inc.: *See—*
Collins, Jack T., 3,620,070.
Automobiles Peugeot: *See—*
Leconte, Jacky, 3,620,566.
Avco Corporation: *See—*
Black, Jay I., 3,620,081.
Avila, Francisco C.: *See—*
Sims, Marion W.; and Avila, Francisco C.,3,620,886.
Ayerst, McKenna & Harrison, Limited: *See—*
Santroch, George; and Davis, Martin A., 3,621,038.
Ayukawa, Yukitada: *See—*
Kozu, Isao; and Ayukawa, Yukitada,3,620,429.
Babcock & Wilcox Company, The: *See—*
Pease, Morris G., 3,620,242.
Back, Jarl Sigurd: *See—*
Soderberg, John Lennart; Back, Jarl Sigurd; and Hakansson, Christer Lennart,3,620,857.
Backer, Stanley. Apparatus for discharging static electricity. 3,621,164, Cl. 200-61.58
Backwell, Terence Frank, to Robinson Waxed Paper Company, Limited, The. Method of making laminated web material using a reusable carrier. 3,620,872, Cl. 156-231.
Baclit, Paul S. Nursing bottle holder. 3,620,491, Cl. 248-106.
Badger, Algernon S.; and Moffitt, Jerrell F., to Geo Space Corporation. Binary amplifier gain control. 3,621,410, Cl. 330-2.
Badger Company, Inc., The: *See—*
Miserlis, Constantine D., 3,620,928.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht, 3,621,055.
Hahn, Erwin; and Wippel, Hans Guenter, 3,621,007.
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; Jeserich, Wolfgang-Dieter; and Reichel, Bernd, 3,621,001.
Zeidler, Adolf; Koenig, Karl-Heinz; Fischer, Adolf; and Jung, Johann, 3,621,017.
Baglia, Vitaly Mikhailovich: *See—*
Medovar, Boris Izrailevich; Baglia, Vitaly Mikhailovich; Sevruk, Albert Nikolaevich; and Latash, Jury Vadimovich,3,620,287.
Bailey, Alfred J., to Massey-Ferguson Services N.V. Metering device. 3,620,419, Cl. 222-298.
Bailey, Doris S. Ash tray. 3,620,225, Cl. 131-235.
Bailey, James L.; and Rodgers, Franklin A., to Polaroid Corporation. Corrugated micropermeable membrane. 3,620,895, Cl. 161-123.
Baker, Bernard Stuart, to Courtaulds Limited. Transducers. 3,621,418, Cl. 335-222.
Baker, Charles E.; and Martel, Bob E., to Texas Instruments, Incorporated. Laser display. 3,621,133, Cl. 178-7.3
Baker Perkins Inc.: *See—*
Elson, Ronald D.; and Krenke, Norman O., 3,620,387.
Jones, Morris C., Jr.; and La Pan, Gary Eugene, 3,620,355.
Bakker, Lewis P.: *See—*
Somerville, Robert H.; and Bakker, Lewis P.,3,620,298.
Bakker, Nicolaas: *See—*
Honnen, Lewis R.; and Bakker, Nicolaas,3,620,977.
Bala, Mitchell J.: *See—*
Blecherman, Sol S.; Bala, Mitchell J.; Evans, Dennis J.; and Ulion, Nicholas E.,3,620,815.
Balents, Leon Martin: *See—*
Franklin, David Louis; and Balents, Leon Martin,3,620,692.
Balm Paints Limited: *See—*
Morrison, Alexander Robley; and Herrmann, Heinz Dieter, 3,620,949.
Balsam, Maurice M. Apparatus for affixing small discrete articles to supports. 3,619,889, Cl. 29-208.
Baltadonis, Edward M. Safety shutoff for engines. 3,620,204, Cl. 123-198.
Baltzer, Donald H., to Vari-Light Corporation. Liquid crystal systems. 3,620,889, Cl. 161-5.
Balzers Patent-und Beteiligungs-AG: *See—*
Kraus, Thaddaus; Paesold, Gerold; and Metzler, Elmar, 3,619,839.
Bamberg, Peter; Ekstrom, Bertil Ake; and Sjoberg, Berndt Olof Harald, to Aktiebolaget Astra. Derivatives of aminopenicillanic acid. 3,621,029, Cl. 260-306.7
Banana Control, Inc.: *See—*
McDonnell, Gerald F.; and Freebairn, Hugh T., 3,620,765.
Banasiewicz, Henryk; and Logie, Frank Mc Lean, to Bradley, G. & E., Limited. Bridge type amplitude modulators. 3,621,474, Cl. 332-47.
Banks, Bruce A., to United States of America, National Aeronautics and Space Administration. Ion thruster magnetic field control. 3,620,018, Cl. 60-202.
Banks, Burton L.: *See—*
Friedman, Herman H.; Pitchon, Esra; Cascione, Alexander S.; and Banks, Burton L.,3,620,758.
Banta, Robert D.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,621,193.
Barber, Ronald C., to Tektronix, Inc. Monostable multivibrator having wide timing range. 3,621,299, Cl. 307-273.
Barbieri, Ugo; and Dal Pra, Giancarlo. Machine for obtaining metal castings. 3,620,296, Cl. 164-308.
Bard, C. R., Inc.: *See—*
Thackston, Thomas, 3,620,214.
Barillot, Maurice: *See—*
Denis, Michel; and Barillot, Maurice,3,620,946.
Barish, Leo: *See—*
Lenz, Robert W.; Barish, Leo; and Lyons, Virginia L.,3,620,666.
Barker, Donald E. Facial nerve stimulator. 3,620,219, Cl. 128-410.
Barker, Ronald C., to Applied Laser Technology, Incorporated. Holographic method and apparatus for information storage and retrieval. 3,620,590, Cl. 350-3.5
Barlow, Carl A., Jr., to Texas Instruments, Incorporated. Method and apparatus for seismic-magnetic prospecting. 3,621,380, Cl. 324-1.
Barnes Engineering Company: *See—*
Barnes, Robert Bowling; and Engborg, Nelson E., 3,621,253.
Barnes, Robert Bowling; and Engborg, Nelson E., to Barnes Engineering Company. Combination infrared and isotope scanner. 3,621,253, Cl. 250-71.5
Barr, Charles R., to Eastman Kodak Company. Color photographic material comprising nondiffusing coupler and DIR hydroguinone. 3,620,746, Cl. 96-74.
Barr, Harold N.: *See—*
Princiotta, Frank T.; and Barr, Harold N.,3,621,261.
Barrett, Allan G.; and Albers, Francis L., to United States of America, Navy. Restraining collar device for squibbing missile motors. 3,620,072, Cl. 73-117.4
Barron, Benjamin, to Cox & Company, Inc. Arrangement for igniting and operating gaseous discharge lamps. 3,621,331, Cl. 315-207.
Barrow, Robert B.; and Hostetler, Jeffrey D., to United Aircraft Corporation. Directionally solidified castings. 3,620,288, Cl. 164-52.
Barstrom, Knut A.: *See—*
Doran, Richard S.; and Barstrom, Knut A.,3,620,161.
Bartel, Gunter Friedrich; Klawitter, Martin; and Denker, Ernst. Apparatus for continuously making thermoplastic polyurethanes. 3,620,680, Cl. 23-260.
Barth, Alfred. Direct-voltage transformer. 3,621,361, Cl. 321-2.
Bartha, Zoltan; Vad, Laszlo; Biro, Imre; and Farkas, Otto, to Orszagos Gumiipari Vallalat. Pneumatic tyres. 3,620,279, Cl. 152-356.
Bartlett, Philip Lee, to Du Pont de Nemours, E. I., and Company. Amides of hexafluoropropylene oxide polymer acids and polyalkylene oxide. 3,621,059, Cl. 260-561.
Bartley, Donald R., to Goodrich, B. F., Company, The. Method of making a pneumatic tire. 3,620,867, Cl. 156-117.
Barton, James S.: *See—*
Albright, Thomas M.; and Barton, James S.,3,620,197.
Barton, Oliver Alfred: *See—*
Eckardt, Carl R.; Barton, Oliver Alfred; and Hetterly, Ralph Milton,3,620,860.
Bass, Patrick, to United Gas Industries Limited. Road pricing meter. 3,621,207, Cl. 235-92.
Bast, Orval C.: *See—*
Mueller, Armand G.; Bast, Orval C.; and Schmeling, William H.,3,621,161.
Battelle Development Corporation: *See—*
Wieck, Gregory J., 3,620,250.
Batten, Ronald W., to Hi-Shear Corporation. Offset driver for threaded fasteners. 3,620,105, Cl. 81-57.14
Batzer, Hans: *See—*
Porret, Daniel; Batzer, Hans; Schmid, Rolf; and Ruf, Peter,3,620,983.
Bauer, Douglas M., to General Electric Company. Voltage controlled oscillator. 3,621,469, Cl. 331-111.
Bauer, Klaus: *See—*
Wagner, Otto; Bauer, Klaus; Kaufmann, Wilfried; Rauenbusch, Erich; Arens, Alfred; and Irion, Eckart,3,620,926.
Bauer, Randy L.; Johnson, David C.; and Noss, Ronald M., to Borg-Warner Corporation. Metal plating of thermoplastics. 3,620,804, Cl. 117-47.
Bauman, Robert Andrew, to Colgate-Palmolive Company. Quaternary ammonium compounds. 3,621,048, Cl. 260-455.
Baumann, Gerald W.; Norwood, Richard E.; and Rueger, William J., to International Business Machines Corporation. Constant mass flow pressurized air bearing. 3,620,430, Cl. 226-97.
Baumer, Wilhelm: *See—*
Fruhstorfer, Wolfgang; Namenyi, Istvan; Baumer, Wilhelm; and Dennler, Bernd,3,621,034.
Bausch & Lomb Incorporated: *See—*
Letter, Eugene C., 3,620,866.
Baxter Laboratories, Inc.: *See—*
Harvey, Muerner S.; and Viebrock, Frederick W., 3,620,924.
Beale, Richard D., to Rolls-Royce Limited. Thrust reverser for jet propulsion engines. 3,620,022, Cl. 60-226.
Bean, Kenneth E.: *See—*
Gleim, Paul S.; and Bean, Kenneth E.,3,620,833.
Beatrice Foods Co.: *See—*
Peterson, Marvin A., 3,620,769.
Beaty, Charles A., to RFD, Inc. Super regenerative amplifier oscillator with tunnel diode. 3,621,465, Cl. 331-107.

Beaunit Corporation: *See—*
Lineberger, Robert O.; Wiberley, James S.; and Griffin, Joseph R., 3,620,803.

Bechtler, Gunter: *See—*
Netheler, Heinrich; Bergmann, Wilhelm; and Bechtler, Gunter,3,621,215.

Beck, Roger W., to General Motors Corporation. Coatings for germanium semiconductor devices. 3,620,829, Cl. 117-201.

Beck, Roland D., to International Telephone and Telegraph Corporation. Thermostat. 3,621,432, Cl. 337-100.

Beck, William H.; and Trimble, Daniel W., to Garrett Corporation, The. Parallel coupled static inverters. 3,621,365, Cl. 321-27.

Becker, Erich: *See—*
Mahler, Ernst; Becker, Erich; Czapla, Hansulrich; Klasse, Fritz; and Ehrcke, Ulrich,3,620,783.

Becking, Hermann. Electromagnet clutch or brake, twisted torsion spring therefor. 3,620,339, Cl. 192-84.

Becton, Dickinson and Company: *See—*
Stevens, Frank W.; and Young, Harvey Theodore, 3,620,418.

Bednarek, John H.: *See—*
Rubner, Tibor; Wavre, Andre; and Bednarek, John H.,3,621,278.

Beelik, Andrew; and Wilson, Jim D., to International Telephone and Telegraph Corporation. Mercerization of cellulosic materials using a solution containing a mercerizing concentration of alkali and a barium compound. 3,620,912, Cl. 162-90.

Beermann, Paul; and Grosse-Benne, Willi, to Rinker, Richard. Firing mechanism with a pivoted finger piece mounted on a pivoted trigger link. 3,619,930, Cl. 42-69.

Begemann, Jurgen: *See—*
Rehmet, Manfred; and Begemann, Jurgen,3,621,322.

Beguin, Rene; and Burckhardt, Christof, to Test, Societe Anonyme d'Etudes Techniques. Digital integrator. 3,620,090, Cl. 74-31.

Behring Corporation: *See—*
Shoquist, William A., 3,620,246.

Belcher, Richard A., to Chase-Shawmut Company, The. Electric cartridge fuse having plug terminals. 3,621,433, Cl. 337-244.

Bell & Howell Company: *See—*
Carlson, Richard K., 3,620,610.
John, Robert S., Jr., 3,620,609.
Koeber, Henry J., 3,620,150.
Ray, Robert C., 3,620,474.
Tarrson, Irvin S., 3,620,893.

Bell, Frank W.: *See—*
Mongerson, Paul A.; Moen, Alfred M.; and Bell, Frank W.,3,620,254.

Bell, Richard E., to AMF Corporated. Precision reed type snap switches. 3,621,415, Cl. 335-205.

Bell Telephone Laboratories, Incorporated: *See—*
Antas, Stanley Casimir; Genneken, George Thomas; and Smith, Donald Tolman, 3,621,117.
Ashkin, Arthur, 3,620,599.
Businger, Peter A., 3,621,209.
Clark, Conrad A.; Dumbri, Austin C.; and Roberts, James F., 3,620,814.
Daugherty, Thomas Henry, 3,621,396.
Dudderar, Thomas Dixon; and O'Regan, Richard, 3,620,589.
Gardner, William Allen, 3,621,402.
Guenther, Robert P., 3,621,485.
Johnson, Arlen Kent; and Zysman, George Isaac, 3,621,478.
Misawa, Toshio, 3,621,466.
Morse, Charles E.; and Smith, John P., 3,621,146.
Olson, Hilding Matthews, Jr., 3,621,463.
Pfann, William G., 3,620,686.
Singh, Shobha; and Van Uitert, Le Grand G., 3,621,340.
Smith, George E.; and Walden, Robert H., 3,621,446.

Bell, William W., Jr.: *See—*
Leonard, Louis H., Jr.; and Bell, William W., Jr.,3,620,036.

Bella, Italo Della. Semiautomatic packing machine for textiles. 3,619,973, Cl. 53-64.

Bellan, Heinrich: *See—*
Eggenmuller, Alfred; Scherer, Lorenz; Bellan, Heinrich; and Wohrle, Rudolf,3,619,995.

Beloit Corporation: *See—*
Eklund, Henrik J.; and Seaquist, Alfred J., 3,620,911.
Keyes, Marion A., IV; Gudaz, John A.; and Tsing, Yuan-Hao, 3,620,915.

Beltran, Luis C. Vargas. Wire tensioner, cutter, and staple extractor for cattle fences. 3,620,263, Cl. 140-123.6

Bendix Corporation, The: *See—*
Ferguson, Lowell D.; and Carrico, John P., 3,621,242.
Gauger, Roy C., 3,620,956.
Gunshinan, Bernard F.; and Hand, Frederick W., Jr., 3,621,486.

Benham, Thomas H., to United States of America, Atomic Energy Commission. Metallizing chamber viewing system. 3,620,604, Cl. 350-301.

Benis, Isak; Benis, William; and Shrage, Moshe. Sheet metal speed file. 3,619,878, Cl. 29-78.

Benis, William: *See—*
Benis, Isak; Benis, William; and Shrage, Moshe,3,619,878.

Benjamin, Benjamin C., to Schmelzer Corporation. Liquid controlled dashpot. 3,620,523, Cl. 267-34.

Benke, Frank W., to Westinghouse Electric Corporation. Air core reactor. 3,621,429, Cl. 336-197.

Benko, Pal; Budai, Zoltan; and Pallos, Laszlo, to Egyesult Gyogyszer es Tapszergyar. Formamidine derivatives and process for the preparation thereof. 3,621,061, Cl. 260-564.

Bennett, Harold W.; and Richards, Barry E., to Raytheon Company. Apparatus for performing a plurality of windings. 3,619,884, Cl. 29-203.

Bennon, Saul, to Westinghouse Electric Corporation. Electrical reactor. 3,621,427, Cl. 336-84.

Bennon, Saul; and Moore, Harold R., to Westinghouse Electric Corporation. Transformer with bushing compartment. 3,621,426, Cl. 336-58.

Benzon-Petersen, Boye; and Dilot, Rolf Magnus, to AB Akerlund & Rausing. Method of making a plastic package with a label. 3,620,871, Cl. 156-212.

Beretta, Pier Carlo, to P. Beretta-Armi-Roma S.p.A. Fixed barrel automatic pistol having a stopping device for the carriage. 3,620,125, Cl. 89-196.

Berg, Josef, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injection nozzle for internal combustion engines. 3,620,456, Cl. 239-533.

Berger, Abe; and Selin, Terry G., to General Electric Company. Organosilicon compounds. 3,621,046, Cl. 260-448.8

Berger, Herbert; Dold, Otto; Kruger, Dietrich; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald, to Boehringer Mannheim Gesellschaft mit beschrankter Haftung. Diagnostic aids for use in the detection of bacteria in biological and other fluids. 3,621,016, Cl. 260-240.1

Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Voemel, Wolfgang; and Sauer, Winfriede, to Boehringer Mannheim GmbH. Antibacterial 5-nitrofuryl-pyrimidines. 3,621,022, Cl. 260-251.

Berger, Martin. Power pulse circuit. 3,621,296, Cl. 307-252.

Bergfelt, Nils H.: *See—*
Spellman, Vernon C.; Bergfelt, Nils H.; and Small, Edward A.,3,619,840.

Bergling, Charles Gunnar Birger, to Ingenjorsfirma Hebe AB. Device for conveying reinforcing elements to a welding station and for holding and aligning these in relation to a sheet of metal at the welding station. 3,620,382, Cl. 214-1.

Bergmann, Wilhelm: *See—*
Netheler, Heinrich; Bergmann, Wilhelm; and Bechtler, Gunter,3,621,215.

Bergstrom, Theodore R., to Minnesota Mining and Manufacturing Company. Sintered austenitic-ferritic chromium-nickel steel alloy. 3,620,690, Cl. 29-182.

Berler, Robert M., to Pitney Bowes-Alpex, Inc. Hand held coded document reader into which document is first inserted and then read as it is withdrawn. 3,621,265, Cl. 250-219.

Berndt, Edward W.; and Vatne, Robert D., to Salsbury Laboratories. Composition for treating histomoniasis in poultry. 3,621,095, Cl. 424-232.

Berry, Clifford M.: *See—*
Taylor, James R.; and Berry, Clifford M.,3,620,192.

Berry Metal Company: *See—*
Berry, William W., 3,620,455.

Berry, William W., to Berry Metal Company. Easily repairable gas injection lance. 3,620,455, Cl. 239-132.3

Besacier, Jean. Method of manufacturing electric lamps, bases for carrying out said method and lamps thus obtained. 3,619,876, Cl. 29-25.13

Bethlehem Steel Corporation: *See—*
Miller, Edwin B., Sr., 3,620,178.

Beutnagel, Fred W. Sewage chlorinator. 3,620,416, Cl. 222-59.

Bexford Limited: *See—*
Boutle, David Leonard; Clachan, Margaret Loudon; and Kennedy, David Rankine, 3,620,812.

Bickenson's Ltd.:*See—*
Robinson, Edgar C., 3,620,657.

Billeruds Aktiebolag: *See—*
Kapare, Erik Gunnar, 3,619,968.

Billings, Calvin H. Single well heated gas mining method and apparatus. 3,620,571, Cl. 299-6.

Billings, Philip M., to Sanders Associates, Inc. Magnetic tape storage device. 3,621,152, Cl. 179-100.2

Bills, Max E.; and Hansen, Henry J., Jr., to United States Steel Corporation. Cold rolling work roll. 3,619,881, Cl. 29-121.

Binnings, Gerald F., to Aerojet-General Corporation. Microscope slides. 3,620,596, Cl. 350-95.

Birch, David W., to Essex Recon Corporation. Thermoplastic sheet forming machine. 3,619,864, Cl. 18-19.

Bird, Joseph W., to Burroughs Corporation. Multipole double throw relay. 3,621,414, Cl. 335-174.

Biro, Imre: *See—*
Bartha, Zoltan; Vad, Laszlo; Biro, Imre; and Farkas, Otto,3,620,279.

Bitting, James L.: *See—*
Zatopek, Edward J.; and Bitting, James L.,3,620,243.

Bittorf, Hannjorg: *See—*
Heynisch, Hinrich; Bittorf, Hannjorg; and Veith, Werner,3,621,319.

Bivans Corporation: *See—*
Bivans, Elbert L.; and Kund, August, 3,620,386.

Bivans, Elbert L.; and Kund, August, to Bivans Corporation. Accumulator for cartoning machine. 3,620,386, Cl. 214-7.

Bixby, George, Jr., to Automatic Marketing Industries, Inc. Coffee brewing apparatus. 3,620,155, Cl. 99-295.

Blachly, Donald L.; and Smith, Richard A., to Oster, John Manufacturing Co. Portable steamer. 3,620,055, Cl. 68-222.

Black and Decker Manufacturing Company, The: *See—*
Wells, Kenneth R., 3,619,998.

Black, Jay I., to Avco Corporation. Fluidic temperature sensor mount for a gas turbine engine. 3,620,081, Cl. 73-340.

Blair, Lloyd R.; and Martin, Gregory L., to Goodyear Aerospace Corporation. Linear sweep frequency generator with sampling circuit phase control loop. 3,621,450, Cl. 331-10.

Blaisdell, Kenneth R. Sequential pulsing system. 3,620,127, Cl. 91-412.

Blakely, Christine Mary: *See—*
Parkinson, Norman; Blakely, Christine Mary; and Russell, Robert Francis, 3,620,366.

Blecherman, Sol S.; Bala, Mitchell J.; Evans, Dennis J.; and Ulion, Nicholas E., to United Aircraft Corporation. Vapor collimation in vacuum deposition of coatings. 3,620,815, Cl. 117-106.

BLH Electronics, Inc.: *See—*
Laimins, Eric; and Lockery, Harry E., 3,620,074.
Wu, Charles T., 3,621,436.

Block, Lester W. Shelf-less push-up brassiere pad. 3,620,222, Cl. 128-481.

Blohm & Voss AG.: *See—*
Munte, Harm-Heinrich, 3,620,019.

Blumenfeld, Klaus H.: *See—*
Hubbard, Ronald R.; and Blumenfeld, Klaus H., 3,620,471.

Bobo, Evan H. Plumbing of a tank filler valve for a commode. 3,619,821, Cl. 4-41.

Boehringer Mannheim Gesellschaft mit beschrankter Haftung: *See—*
Berger, Herbert; Dold, Otto; Kruger, Dietrich; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald, 3,621,016.

Boehringer Mannheim GmbH: *See—*
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Voemel, Wolfgang; and Sauer, Winfriede, 3,621,022.

Boeing Company, The: *See—*
Morrow, Elmore F., 3,620,568.

Bogdanski, William. Double check valve vent. 3,620,240, Cl. 137-202.

Bohn, Floyd O., to Dresser Industries, Inc. Combination bullet perforating gun and shaped charge perforator apparatus and method. 3,620,314, Cl. 175-4.59

Boissevain, Mathew G., to Measurex Corporation. Sheet gauging apparatus. 3,621,259, Cl. 250-83.3

Bolt, Henry; and Nelson, Richard, to Bonel Co., mesne. Support structures for signs and the like. 3,620,496, Cl. 248-171.

Bolzan, James J., Jr.; and Fromknecht, Charles T., to Singer Company, The. Convertible canister vacuum cleaner. 3,619,851, Cl. 15-330.

Bonel Co.: *See—*
Bolt, Henry; and Nelson, Richard, 3,620,496.

Bonilla, Charles F.: *See—*
Day, George G.; and Bonilla, Charles F., 3,620,942.

Bonneric, Francis, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Method and apparatus for providing a cyclic supply of sequences proportional to a given fraction of the duration of a working cycle. 3,621,264, Cl. 250-219.

Boothe Airside Services, Inc.: *See—*
Eggert, Walter S., Jr.; and Herring, James M., Jr., 3,620,565.

Borg-Warner Corporation: *See—*
Bauer, Randy L.; Johnson, David C.; and Noss, Ronald M., 3,620,804.
Muench, Paul W., 3,620,038.
Roberts, Richard W., 3,620,130.

Borkowski, Casimer J., to United States of America, Atomic Energy Commission. Differential pressure nuclear radiation flux detector. 3,621,254, Cl. 250-83.

Borodin, Daniel J., to U.S. Automation Company. Transfer device. 3,620,380, Cl. 214-1.

Borsum, Adolph W. Dispensing closure device for tablet container. 3,620,413, Cl. 221-289.

Bosch, Robert, G.m.b.H: *See—*
Hofer, Gerald; and Nothdurft, Heinz, 3,620,647.
Hofer, Gerald; and Nothdurft, Heinz, 3,620,648.
Kuhn, Karl-Ernst; Kuschmierz, Heinz; and Staudt, Heinrich, 3,620,199.
Wessel, Wolf, 3,620,196.

Bosma, Hendrik, to U.S. Philips Corporation. Three-port circulator comprising only two crossing coils. 3,621,477, Cl. 333-1.1

Bosshard, Fritz, to Schweizerische Industrie-Gesellschaft. Device for the feeding and cyclic treatment of a body with synchronizing of treatment device and feed device. 3,620,111, Cl. 83-74.

Boswell, George Albert, Jr., to Du Pont de Nemours, E. I., and Company. 6,6-Difluoro-17β-hydroxy-17α-ethynyl-4-estren- 3-one and 6,6-difluor o-13β-ethyl-17β-hydroxy-17α -ethynyl-4-gonen-3-one ethylene ketals. 3,621,010, Cl. 260-239.55

Bottone, Salvatore, Jr.: *See—*
Ringwall, Carl G.; and Bottone, Salvatore, Jr., 3,621,453.

Bourlet, Claude; and Deprez, Louis. Loom tension-frame holding the woven fabric over its entire width. 3,620,260, Cl. 139-292.

Bourquin, Maurice A., to M.A.B. Machine Corporation, The. Safety ladder. 3,620,332, Cl. 182-108.

Boutle, David Leonard; Clachan, Margaret Loudon; and Kennedy, David Rankine, to Bexford Limited. Film material for lithographic plates. 3,620,812, Cl. 117-76.

Boving, Knud Giede. Rubbish incinerator. 3,620,177, Cl. 110-8.

Bowditch, Hoel L., to Foxboro Company, The. Differential pressure capsule with temperature compensation. 3,620,135, Cl. 92-97.

Bowen, John C., to Duriron Company, Inc., The. Valves. 3,620,251, Cl. 137-614.11

Bracker AG: *See—*
Ramseier, Paul, 3,620,060.

Bradbury, Wilburn F., to SCM Corporation. Record reader. 3,621,205, Cl. 235-61.11

Bradley, G. & E., Limited: *See—*
Banasiewicz, Henryk; and Logie, Frank Mc Lean, 3,621,474.

Braginetz, Paul A., to Morris, Philip, Incorporated. Razor with flexible band blade. 3,619,901, Cl. 30-40.

Brandini, Adhemar: *See—*
Quick, Graeme R.; and Brandini, Adhemar, 3,620,224.

Brandt, Gerald B., to Westinghouse Electric Corporation. Spatial frequency diversity for coherent optical processing. 3,620,598, Cl. 350-162.

Bratt, Geoffrey Charles; and Brown, Dereck Wilson, to Electrolytic Zinc Company of Australia Limited. Recovery of lead values from solution. 3,620,670, Cl. 23-127.

Bratton, Francis H.; and Smith, John M., to Ensign-Bickford Company, The, mesne. Radiant energy signal transmission system. 3,620,166, Cl. 102-70.2

Braun, Morris, to Braun, W., Company. Closures for bottles and the like. 3,620,400, Cl. 215-44.

Braun, W., Company: *See—*
Braun, Morris, 3,620,400.

Bravin, Ben, to General Cable Corporation. Separator for unprocessed wire in reeling and winding apparatus. 3,620,482, Cl. 242-25.

Bregoff, Robert M.: *See—*
Golumbic, Harvey J., 3,620,865.

Breitschwerdt, Werner; and Andres, Rudolf, to Daimler-Benz Aktiengesellschaft. Safety installation in a fuel feed line. 3,620,198, Cl. 123-136.

Brelsford, John E.; and Howell, Edmund O., to Sperry Rand Corporation. Steering wheel mounting on a self-propelled combine. 3,619,992, Cl. 56-10.1

Bremerman, Eugene S. Adjustable suspension apparatus for electrolytic water treatment. 3,620,951, Cl. 204-196.

Brenia, Paul S.; and Prete, Ernest, Jr., to Ancra Corporation. Rattleproof tie-down assembly. 3,620,171, Cl. 105-369.

Bridge, Alan G.; Jaffe, Joseph; and Mitchell, David S., to Chevron Research Company. Desulfurization process employing upflow oil and hydrogen. 3,620,968, Cl. 208-216.

Bridges, John B., to Cameron Iron Works, Inc. Disposable liner. 3,620,522, Cl. 266-43.

Bridle, Kenneth F., to A.B. Electronic Components Limited. Electrical connectors. 3,621,449, Cl. 339-99.

Briggs & Stratton Corporation: *See—*
Harkness, Joseph R., 3,620,203.
Santi, John D., 3,621,275.

Bright, Lawrence S., to Evans, Chandler, Inc. Fluidic angular position transducer. 3,620,239, Cl. 137-81.5

Brinkema, Robert J., to Ryerson, Joseph T., & Son, Inc., mesne. Reinforced plastic filter plate structure. 3,620,374, Cl. 210-231.

British Insulated Callender's Cables Limited: *See—*
Daker, Horace Herbert; Martin, Raymond Alfred; and Rose, John, 3,620,001.

British Iron and Steel Research Association, The: *See—*
Campbell, John, 3,621,103.
Sabatini, Bruno; and Yeomans, Kenneth A., 3,620,058.

British Petroleum Company Limited, The: *See—*
Pearson, Clive Leonard, 3,620,457.

British Petroleum Company, The: *See—*
McGrath, Brian Patrick; and Williams, Keith Vaughan, 3,621,073.

British Railways Board: *See—*
Henley, Eric Douglas; and Walker, George Eden, 3,620,334.

British Ropes Limited: *See—*
Paddington, Arthur L., 3,620,556.
Paddington, Arthur Loftus, 3,620,268.

Bro, Jacques, to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies). Fence stretcher. 3,620,503, Cl. 254-30.

Broderick, John P.; Wishnie, Frederick T.; and Keys, Don L., to Eutectic Corporation. Flame spray torch. 3,620,454, Cl. 239-79.

Brooke, Thomas A.; and Neller, William C., to Dunlop Holdings Limited. Conveyors. 3,620,346, Cl. 198-16.

Brooks, Burton: *See—*
Brooks, Richard J.; and Brooks, Burton, 3,620,684.

Brooks, Richard J.; and Brooks, Burton, to Chemithon Corporation. Apparatus for continuous sulfonation. 3,620,684, Cl. 23-285.

Brother Kogyo Kabushiki Kaisha: *See—*
Mano, Morimasa, 3,620,446.

Brouard, Claude Marie Henri Emile: *See—*
Jirou, Marcel Georges; and Brouard, Claude Marie Henri Emile, 3,621,006.

Brouwer, Frans; and Sobchak, Frank L., to Stewart-Warner Corporation. Facsimile optical scanner and lighting means. 3,621,135, Cl. 178-7.6

Browder, Timothy J., Jr., to Parsons, Ralph M., Company, The. Method of producing sulfuric acid. 3,620,673, Cl. 23-168.

Brown & Root, Inc.: *See—*
Ward, Delbert R.; and Rochelle, William R., 3,620,554.

Brown, Archer W.; Montgomery, James L.; and Erkenbrack, Lorraine V., to American Hoist & Derrick Company. Extensible boom assembly. 3,620,579, Cl. 308-3.

Brown, David J. B., to Winget Limited. Trailer couplings. 3,620,551, Cl. 280-479.

Brown, Dereck Wilson: *See—*
Bratt, Geoffrey Charles; and Brown, Dereck Wilson,3,620,670.

Brown, Elton H., Jr.: *See—*
Craig, Dwin R., 3,621,231.

Brown, Francis Charles, to Artisan Industries Inc. Falling film evaporator stripper. 3,620,283, Cl. 159-13.

Brown, George M., to Century Drill and Tool Company. Drill bit stop. 3,620,637, Cl. 77-55.

Brown, Harold L.; and Vaught, Le Roy M. Method and apparatus for determining the cutting time of a machine tool. 3,621,395, Cl. 324-181.

Brown, Lowell N. Air hammer construction. 3,620,311, Cl. 173-136.

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Brown, Ross M., to Desalination Systems, Inc. Combination plumbing fixture for water purification system having waste by-pass flow. 3,620,241, Cl. 137-216.

Brown, Stewart C., to Xerox Corporation, mesne. Multichannel switching system with unity-gain isolation amplifier operatively connected between the selected channel and remaining open channels. 3,621,288, Cl. 307-243.

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Brownscombe, Eugene R.: *See—*
Wunderlich, Donald K,; Carleton, Finis E.; and Brownscombe, Eugene R.,3,620,697.

Broxholm, Thomas M.: *See—*
Elmore, Lester C.; and Broxholm, Thomas M.,3,620,313.

Brumberg, Rafail Mikhailovich; Trostanetsky, Leonid Moiseevich; and Khlebnikov, Albert Leonidovich. Method of conveying free-flowing and lump materials upwards and a vibratory elevator embodying said method. 3,620,358, Cl. 198-220.

Brumm, Wayne R., to Electronic Memories and Magnetics Corporation. Current pulse stabilizer for variable loads. 3,621,371, Cl. 323-17.

Brummett, Carl C., to Shands, Hazel F. Brummett. Automatic fish hooking device. 3,619,931, Cl. 43-15.

Brunaud, Marcel D. P.: *See—*
Laboureur, Pierre; Brunaud, Marcel D. P.; and Langlois, Claude,3,620,923.

Bruner, Mates A. Calendar watch band. 3,619,923, Cl. 40-118.

Brunswick Corporation: *See—*
Conklin, Robert M.; and Witucki, Ralph E., 3,620,537.

Bryan, Roland J., Jr., to Monsanto Company. Method of imparting flame resistant properties to nylon and the treated product. 3,620,818, Cl. 117-118.

Bryan-Brown, Martin Hume: *See—*
Halliwell, David George; Outram, Michael Vaughan; and Bryan-Brown, Martin Hume,3,620,020.

Bryndza, Robert M.; and Wiersma, Fonger, to Electronic Associates, Inc. Amplitude modulated RF generator for quadrupole mass analyzer. 3,621,464, Cl. 331-106.

Bubik, Leslie, to Vulvan Equipment Company, Limited. Vehicle towing assembly. 3,620,393, Cl. 214-86.

Buchman, Louis J.: *See—*
Welsch, Walter N.; and Buchman, Louis J.,3,619,949.

Buckbee-Mears Company: *See—*
Davies, John G., 3,620,627.

Buczek, Walter F.: *See—*
Conant, John E.; and Buczek, Walter F.,3,619,912.

Budai, Zoltan: *See—*
Benko, Pal; Budai, Zoltan; and Pallos, Laszlo,3,621,061.

Budde, Paul B.: *See—*
Tolkmith, Henry; Seiber, James N.; and Budde, Paul B.,3,621,031.

Budzyna, Joseph M.; and Mucciarone, Rocco H., to North American Rockwell Corporation. Shuttle binder actuating mechanism. 3,620,259, Cl. 139-187.

Bujwid, Zdzislaw Jan; and Hodgson, John Francis, to May & Baker Limited. Process for the preparation of methyl p-aminobenzenesulphonylcarbamate. 3,621,042, Cl. 260-397.7

Bulcock, Colin L., to Lupton Bros. Ltd. Loom temples. 3,620,261, Cl. 139-295.

Bulova Watch Company, Inc.: *See—*
Dostal, Frank, 3,621,467.

Bump, Edward L., to Vaughan Mfg. Co. Roll paper dispenser. 3,620,466, Cl. 242-55.3 .

Bunish, Steve; Wilson, Floyd A.; and Hansen, Theodore E., to Anaconda Wire and Cable Company. Power cable for portable machines. 3,621,118, Cl. 174-115.

Bunker-Ramo Corporation, The: *See—*
Hilbert, Wolfgang, 3,621,413.
Marz, Frank H., 3,620,004.

Bunny Bear, Inc.: *See—*
Doyle, Maura Jean, 3,619,824.

Bunting, Earl L., to Bunting SteriSystems, Inc. Single wire D. C. communicating means. 3,621,142, Cl. 179-1.

Bunting SteriSystems, Inc.: *See—*
Bunting, Earl L., 3,621,142.

Bunting, William Wallar, Jr.; Evans, Franklin James; and Hook, David Ellis, to Du Pont de Nemours, E. I., and Company. Lightweight nonpatterned nonwoven fabric, 3,620,903, Cl. 161-169.

Burckhardt, Christof: *See—*
Beguin, Rene; and Burckhardt, Christof,3,620,090.

Burgarella, John P., to Polaroid Corporation. Automatic exposure control system with fast linear response. 3,620,143, Cl. 95-10.

Burger, William H., to Kimberly-Clark Corporation. Method and apparatus for bias crosslaying threads. 3,620,868, Cl. 156-181.

Burke, Arthur J.; and Keller, Rudolf, to Richardson, Howe Scale Company. Bag placer. 3,619,981, Cl. 53-190.

Burke, Harold J., to General Motors Corporation. Piston switch controlled by fluid amplifier with time delay. 3,621,167, Cl. 200-82.

Burns, Edward P.; and Lee, Sung C., to Hubbell, Harvey, Incorporated. Ground fault sensing circuit. 3,621,334, Cl. 317-18.

Burns, Russell W., to Merit Abrasive Products, Inc., mesne. Internally powered rotary abrasive means. 3,619,948, Cl. 51-72.

Burroughs Corporation: *See—*
Bird, Joseph W., 3,621,414.

Burum, Harold J., 1/3 to Byrd, Kenneth P., and White, Joseph G. Corner fastener and roller assembly for sliding door frames. 3,619,947, Cl. 49-425.

Businger, Peter A., to Bell Telephone Laboratories, Incorporated. Machine-implemented process for insuring the numerical stability of Gaussian elimination. 3,621,209, Cl. 235-150.

Busse, Oswald; and Klesper, Hugo, to Passavant-Werke. Filter press with cleaning apparatus. 3,620,233, Cl. 134-57.

Butler National Corporation: *See—*
Hobbs, James; Perkins, Earl Stuart; and Floyd, Donald E., 3,621,212.
Perkins, Earl Stuart, 3,621,211.

Butterfield, John L, to General Electric Company. Shaft disconnect-non-shear type. 3,620,045, Cl. 64-28.

Buzzell, Harold O., to Polaroid Corporation. Transparent laminate having at least one layer of a cellulose derivative matrix containing infrared absorber. 3,620,888, Cl. 161-1.

Byett, Maurice John: *See—*
Keen, John Michael Storer; Byett, Maurice John; and Weston, Francis Anthony,3,620,641.

Byrd, Kenneth P.: *See—*
Burum, Harold J., 3,619,947.

Cabezas, Amado Y.; and Koechner, Walter, to Hughes Aircraft Company. Flash tubes and method of providing same. 3,621,458, Cl. 331-94.5

Cabot Corporation: *See—*
Hagopian, Erivan, 3,620,792.

Cacheux, Jean Antoine; and Meuleman, Johannes, to U.S. Philips Corporation. Polygonal-shaped radiation detector employing plural prism-shaped semiconductor crystals. 3,621,256, Cl. 250-83.

Caesar, Horst-Manfred: *See—*
Siggel, Erhard; Rein, Walter; and Caesar, Horst-Manfred,3,621,074.

Cain, Thomas R.; and Medlock, Odas V. Toilet seat auxiliary. 3,619,820, Cl. 4-9.

Calabro, Alfred A.: *See—*
Golumbic, Harvey J., 3,620,865.

Calgon Corporation: *See—*
Swartz, William E., 3,620,767.
Werdouschegg, Fritz M. K.; and Windhager, Robert H., 3,620,828.

California Institute of Technology: *See—*
Miller, Carles G., 3,621,330.

Callan, John E., to Allen-Bradley Company. Controlled rectifier firing circuit. 3,621,295, Cl. 307-252.

Cameron, Ian Lewis: *See—*
Elger, Ronald John; and Cameron, Ian Lewis,3,620,064.

Cameron Iron Works, Inc.: *See—*
Bridges, John B., 3,620,522.

Campbell, Douglas B.: *See—*
Rachwal, Ervin J.; Marculewicz, Robert W.; and Campbell, Douglas B.,3,620,621.

Campbell, John, to British Iron and Steel Research Association, The. Methods of and apparatus for stirring immiscible conductive fluids. 3,621,103, Cl. 13-9.

Canadian Patents and Development Limited: *See—*
Williams, Digby F.; and Schadt, Martin, 3,621,321.

Cancro, Ciro A., to United States of America, National Aeronautics and Space Administration. Fast response low power drain logic circuits. 3,621,277, Cl. 307-206.

Cann, Alfred J., to Sanders Associates, Inc. Correlator with equalization correction. 3,621,221, Cl. 235-181.

Cannell, Lawrence G.: *See—*
Magoon, Eugene F.; Cannell, Lawrence G.; and Raley, John H.,3,620,981.

Canning, Terry D.; and Jaycox, Richard L., to Collins Radio Company. Combined performance and command indicator. 3,621,210, Cl. 235-150.2

Canon Camera Kabushiki Kaisha: *See—*
Komori, Shigehiro, 3,620,620.

Capol, Roman J.: *See—*
Adams, Andrew O.; and Capol, Roman J.,3,621,419.

Carbonel, Michel, to Thomson-CSF. Variable-threshold magnetic circuit element. 3,621,272, Cl. 307-88.

Carborundum Company, The: *See—*
Dooley, Peter C., Jr., 3,620,462.
Economy, James; and Anderson, Raymond V., 3,620,780.

Carleton, Finis E.: *See—*
Wunderlich, Donald K.; Carleton, Finis E.; and Brownscombe, Eugene R.,3,620,697.
Carlisle Chemical Works, Inc.: *See—*
Hechenbleikner, Ingenuin; Hussar, John F.; Koeniger, Arthur F.; and Enlow, William P., 3,621,051.
Carlsen, Walter N., to Itek Corporation. Sinusoidal converter. 3,621,405, Cl. 328-133.
Carlson, Richard K., to Bell & Howell Company. Film footage indicator. 3,620,610, Cl. 352-172.
Carmichael, Keith Stewart, to Du Pont de Nemours, E. I., and Company. Packaging apparatus. 3,619,910, Cl. 34-216.
Carmichael, Thomas. Sanitary closet. 3,619,822, Cl. 4-142.
Carpenter, Raymond: *See—*
Gancberg, Abraam; Carpenter, Raymond; and Paquet, Rene,3,620,453.
Carr, Norman L.; Somers, Allen E.; and Stahlfeld, Donald L., to Gulf Research & Development Company. Special purpose process control computer. 3,621,217, Cl. 235-151.12
Carrico, John P.: *See—*
Ferguson, Lowell D.; and Carrico, John P.,3,621,242.
Carrier Corporation: *See—*
Leonard, Louis H., Jr.; and Bell, William W., Jr., 3,620,036.
Williams, John A., 3,620,039.
Carrier Engineering Company Limited: *See—*
Jones, Ivor Wynford, 3,620,955.
Carroll, David I.: *See—*
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D.,3,621,240.
Carroll, Joseph P. Projectile fuze safe and arming device. 3,620,164, Cl. 102-78.
Carter, Paul M.: *See—*
Tyler, Reginald E. W.; and Carter, Paul M.,3,620,527.
Carter, Raymond L., Jr. Coated roof surface. 3,620,810, Cl. 117-72.
Carvie, Ronald C., to Corning Glass Works. Partially stabilized zirconia refractory. 3,620,781, Cl. 106-57.
Cary, Francis H., to General Signal Corporation. Backpressure device. 3,620,248, Cl. 137-493.
Cary, Francis H., to General Signal Corporation. Metering pump. 3,620,649, Cl. 417-383.
Cary, Philip E.: *See—*
Cary, Robert P.; and Cary, Philip E.,3,620,068.
Cary, Robert P.; and Cary, Philip E., to International Harvester Company. Quench calorimeter. 3,620,068, Cl. 73-15.
Cascione, Alexander S.: *See—*
Friedman, Herman H.; Pitchon, Esra; Cascione, Alexander S.; and Banks, Burton L.,3,620,758.
Case, J. I., Company: *See—*
Christopher, John G., 3,620,308.
Cason, Charles M., III; and Perkins, James F., to United States of America, Army. Self-pumped electro-adiabatic laser. 3,621,461, Cl. 331-94.5
Castillo, Adolfo: *See—*
Jureit, John C.; Csakvary, Oscar; Castillo, Adolfo; Kushner, Benjamin H.; and Karch, Otto J.,3,620,270.
Caterpillar Tractor Co.: *See—*
Coleman, Donald F., 3,621,335.
Albright, Thomas M.; and Barton, James S., 3,620,197.
Herr, Charles H., 3,620,097.
Cecil, Olin B.: *See—*
Sivertsen, David R.; Cecil, Olin B.; and Haberecht, Rolf R.,3,620,945.
Celanese Coatings Company: *See—*
White, John D., 3,620,943.
Celentano, Vincent D., to General Electric Company. Surface preparation on boron filaments for adhesive applications. 3,620,817, Cl. 117-118.
Centre de Recherches Marcel Midy: *See—*
Claude, Rene, 3,619,971.
Centre Electronique Hologer S.A.: *See—*
Zaugg, Roland, 3,620,006.
Centre Electronique Horloger S.A.: *See—*
Fonjallaz, Claude Roger, 3,621,303.
Century Drill and Tool Company: *See—*
Brown, George M., 3,620,637.
Cermat: *See—*
Khoi, Danny James, 3,620,085.
Cerney, Florian B.; and Cerney, Tina M. Playing card holder. 3,620,535, Cl. 273-150.
Cerney, Tina M.: *See—*
Cerney, Florian B.; and Cerney, Tina M.,3,620,535.
Cervantes, Felipe, to Infonics, Inc. Cassette duplicator. 3,620,476, Cl. 242-197.
Cerwonka, Edward J., to GAF Corporation. Positive-working photopolymerization process. 3,620,734, Cl. 96-35.1
Ceskoslovenska akademie ved: *See—*
Stol, Miroslav; Chromecek, Richard; Stoy, Vladimir; Kliment, Karel; and Otoupalova, Jaroslava, 3,620,751.
Chamberlain, Lois M.: *See—*
Sterrett, Robert W.; Jacob, Francis J.; and Chemberlain, Merle D.,3,619,961.
Chambers, Charles William, Jr., to Lorain Products Corporation. Current controlled voltage booster for telephone systems. 3,621,143, Cl. 179-16.
Chambers, Wallace G.: *See—*
Johnston, Robert L.; and Chambers, Wallace G.,3,621,428.
Chambonnet, Andre Alphonse, to La Societe Constructions Metalliques de Provence. Self-propelled machine for supporting an oscillating tool. 3,621,183, Cl. 219-125.
Chana, Howard E., to General Motors Corporation. High ratio, coverage automatic transmission. 3,620,100, Cl. 74-688.
Chandler Evans Inc.: *See—*
Sobanski, Stanley J.; Mastriforte, Otil F.; and Noell, Godwin L., 3,619,882.
Chandler, Jasper S., to Eastman Kodak Company. Compact scanning camera. 3,620,146, Cl. 95-15.
Chang, Joseph J.; and Vora, Madhukar B., to International Business Machines Corporation. Process for forming semiconductor devices with polycrystalline diffusion pathways and devices formed thereby. 3,621,346, Cl. 317-235.
Chapin, Daniel M.: *See—*
Hanline, John V.; and Chapin, Daniel M.,3,621,225.
Chapin, Roger F., Jr.: *See—*
Scott, Eugene W.; and Chapin, Roger F., Jr.,3,620,452.
Charpentier, Jean F.; and Ross, Robert S., to Goodyear Aerospace Corporation. Autostable circular tethered wing balloon. 3,620,486, Cl. 244-33.
Charvoz, Fred A. Self-feeding paint roller. 3,620,633, Cl. 401-147.
Chase-Shawmut Company, The: *See—*
Belcher, Richard A., 3,621,433.
Hitchcock, Paul C., Sr., 3,621,431.
Chavin, Jean-Claude: *See—*
Renault, Philippe; Falcon, Serge; Chavin, Jean-Claude; and Deschamps, Andre,3,620,674.
Cheek, Edward E., to McDowell-Wellman Engineering Company. Bulk material flow control apparatus. 3,620,350, Cl. 198-102.
Chemberlain, Merle D.: *See—*
Sterrett, Robert W.; Jacob, Francis J.; and Chemberlain, Merle D.,3,619,961.
Chemcell Limited: *See—*
Chopra, Sohinger Nath, 3,620,003.
Chemed Corporation: *See—*
Cowen, Samuel H., 3,619,816.
Chemithon Corporation: *See—*
Brooks, Richard J.; and Brooks, Burton, 3,620,684.
Cheney, Stanley O. Survival snowshoes. 3,619,915, Cl. 36-4.5
Chevron Research Company: *See—*
Bridge, Alan G.; Jaffe, Joseph; and Mitchell, David S., 3,620,968.
Hess, Patrick Henry, 3,620,820.
Honnen, Lewis R.; and Bakker, Nicolaas, 3,620,977.
Kozlowski, Robert H.; and Olson, Lloyd J., 3,620,960.
Mulaskey, Bernard F., 3,620,963.
Chiappe, Wayne T., to Continental Can Company, Inc. Mechanical apparatus for electrodeposition of cans. 3,620,952, Cl. 204-198.
Chlumecky, Nicholas: *See—*
Taradash, Samuel; and Chlumecky, Nicholas,3,620,025.
Cholmar, Sidney, to Monsanto Company. Thermoforming plug assembly. 3,619,862, Cl. 18-19.
Chookazian, Nishan G.: *See—*
Guglielmo, Richard J., Sr.; and Chookazian, Nishan G.,3,620,875.
Guglielmo, Richard J., Sr.; and Chookazian, Nishan G.,3,620,876.
Chopra, Sohinger Nath, to Chemcell Limited. Novelty yarn and method of forming same. 3,620,003, Cl. 57-140.
Chou, Tien S.; Tonnell, Wilfred T.; and Wenstrom, Roger A., to Holes-Webway Co., The. Apparatus for manufacturing an album page. 3,620,882, Cl. 156-461.
Chow, Joe G. Y.: *See—*
Herchenroeder, Robert B.; Chow, Joe G. Y.; and Fleitman, Albert H.,3,620,852.
Chris-Craft Industries, Inc.: *See—*
Rosin, Jacob, 3,621,064.
Christensen, Alton O.: *See—*
Vogel, Charles B.; and Christensen, Alton O.,3,621,292.
Christensen, Don Edward, to RCA Corporation. Sequencer. 3,621,487, Cl. 334-11.
Christensen, Edwin H.: *See—*
Germino, Felix J.; Kite, Francis E.; and Christensen, Edwin H.,3,620,842.
Christopher, John G., to Case, J. I., Company. Towing means for agricultural implement. 3,620,308, Cl. 172-248.
Chromecek, Richard: *See—*
Stol, Miroslav; Chromecek, Richard; Stoy, Vladimir; Kliment, Karel; and Otoupalova, Jaroslava,3,620,751.
Chrysler France: *See—*
Godard, Pierre Louis Simon, 3,620,636.
Chu, Victor Fu-Hua; and Manger, Charles Walter, to Du Pont de Nemours, E. I., and Company. Process using colored particles to develop photohardenable imaging layers. 3,620,726, Cl. 96-27.
Chudyk, George, to Oscar I., Judelshon, Inc. Sheet material cutting machine. 3,620,114, Cl. 83-107.
Ciabani, Dina. Apparatus for producing tube portions of non- circular cross-section. 3,619,863, Cl. 18-19.
Ciba Limited: *See—*
Mueller, Willy; and Steinlin, Felix, 3,620,788.
Porret, Daniel; Batzer, Hans; Schmid, Rolf; and Ruf, Peter, 3,620,983.
Schellenberg, Matthias; and Marthaler, Max, 3,620,744.
Cimbalo, Robert N.: *See—*
Haney, Stanley C.; and Cimbalo, Robert N.,3,620,966.

Cincinnati Milling Machine Company, The: *See—*
Perry, Charles B.; and Horlacher, Herman, 3,619,898.
C.I.T.-Compagnie Industrielle des Telecommunications: *See—*
Demartres, Jean; and Teurnier, Roger, 3,621,120.
Rousseau, Claude, 3,621,298.
Cities Service Oil Company: *See—*
Fulford, Richard S., 3,620,305.
Hearn, Charles L.; and Holmes, Charles S., 3,620,304.
Clachan, Margaret Loudon: *See—*
Boutle, David Leonard; Clachan, Margaret Loudon; and Kennedy, David Rankine,3,620,812.
Clancy, Douglas E.; and O'Daniel, Jerome B., to International Business Machines Corporation. Selection system for a dual element typewriter. 3,620,344, Cl. 197-18.
Clark, Charles W. Film support with interchangable camera means. 3,620,145, Cl. 95-11.
Clark, Chester G.: *See—*
Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W.,3,620,813.
Clark, Conrad A.; Dumbri, Austin C.; and Roberts, James F., to Bell Telephone Laboratories, Incorporated. Continuous measurement of the thickness of hot thin films. 3,620,814, Cl. 117-106.
Clark, James D., to Paul of Hawaii, Inc., mesne. Eye mirror. 3,620,605, Cl. 350-305.
Clark, Lawrence Arthur: *See—*
Wenzel, James L.; and Clark, Lawrence Arthur,3,620,046.
Clark, Lowell E., to Motorola, Inc. Transistor circuit having the properties of a unijunction transistor in improved degree. 3,621,300, Cl. 307-283.
Clark, Malcolm D., to Raymond Control Systems, Inc. Switch actuating means and adjustable camming construction. 3,621,172, Cl. 200-153.
Clarke, David R.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,619,896.
Claude, Rene, to Centre de Recherches Marcel Midy. Conditioning method and apparatus for carrying it into practice. 3,619,971, Cl. 53-37.
Clayton, Colin Geoffrey; and Wladyslaw, Bohdan, to United Kingdom Atomic Energy Authority. Method of X-ray fluorescence analysis of materials containing an interfering element. 3,621,245, Cl. 250-51.5
Clayworth, Geoffrey Thomas, to English Electric Valve Company Limited. Microwave electron beam tubes. 3,621,316, Cl. 313-22.
Clearman, Jack F.; Ohlsson, Leonard W.; and Sitko, Robert H., to Whirpool Corporation. Combination ice auger and ice press. 3,620,040, Cl. 62-354.
Cleary, James W., to Phillips Petroleum Company. Dyeable polyolefins and method for producing same. 3,621,075, Cl. 260-857.
Cleaveland, Charles M., to Westinghouse Electric Corporation. Heat conducting fins for bus bars and other electrical conductors. 3,621,108, Cl. 174-15.
Clement, Carl,: *See—*
Fonda-Bonardi, Giusto, 3,620,017.
Clements, Herbert Arthur; and Heybourne, Robert H., to S.S.S. Patents Limited. Power transmission systems. 3,620,336, Cl. 192-35.
Clevepak Corporation: *See—*
Stump, Paul W.; Huber, James A.; and Lipinski, John M., 3,620,869.
Cliff, Rodger A., to United States of America, National Aeronautics and Space Administration. SCR lamp driver. 3,621,294, Cl. 307-252.
Clifford, John E., to AMP Incorporated. Rechargeable cell having moving tape and rotating electrodes. 3,620,843, Cl. 136-6.
Cluett, Ronald D.; and Larka, Vincent E., to Sylvania Electric Products Inc. Attenuation circuit. 3,621,284, Cl. 307-237.
Coal Industry (Patents) Limited: *See—*
Watson, Edward; Wilkins, Dennis M.; and Johnson, Ronald L., 3,621,379.
Coburn, Herbert D.; and Kelly, Gilbert H., to Texas Instruments, Incorporated. Control system. 3,620,328, Cl. 181-0.5
Cochrane, Richard H.: *See—*
Pringle, Frank E.; Wilson, David A.; and Cochrane, Richard H.,3,619,972.
Coe, Harold H.: *See—*
Anderson, William J.; and Coe, Harold H.,3,620,585.
Cohen, Louis, to Goodrich, B. F., Company, The. Method of preparing bead-type polymers. 3,620,988, Cl. 260-17.4
Cohen, Martin J., to Franklin GNO Corporation. Detecting a trace substance in a sample gas com- prising reacting the sample with different species of reactant ions. 3,621,239, Cl. 250-41.9
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D., to Franklin GNO Corporation. Apparatus fand methods for detecting and identifying trace gases. 3,621,240, Cl. 250-41.9
Coherent Radiation: *See—*
Rorden, Robert J.; Dowley, Mark W.; and Mefferd, Wayne S., 3,621,273.
Cohly, Mauj A.; and Sanner, James W., to Tee-Pak, Inc. Edible collagen casing. 3,620,775, Cl. 99-176.
Cole, Henry A., Jr., to United States of America, National Aeronautics and Space Administration. Method and apparatus for measuring the damping characteristics of a structure. 3,620,069, Cl. 73-67.2
Coleman, Donald F., to Caterpillar Tractor Co. Driver circuit for energizing an electrical load in response to signals from a remote source. 3,621,335, Cl. 317-16.
Colgate-Palmolive Company: *See—*
Bauman, Robert Andrew, 3,621,048.
Murray, Leo Thomas, 3,620,807.
Collet, Marnix Guillaume, to U.S. Philips Corporation, mesne. Method of applying a layer of silicon nitride. 3,620,827, Cl. 117-200.
Collingwood, George H.: *See—*
Winckhofer, Robert C.; Weedon, Gene C.; and Collingwood, George H.,3,620,892.
Collins, Dennis W., to Hugh Steeper (Roehampton) Limited. Artificial limbs. 3,619,818, Cl. 3-12.
Collins, Jack T., to Automation Industries, Inc. Ultrasonic material tester. 3,620,070, Cl. 73-67.8
Collins Radio Company: *See—*
Canning, Terry D.; and Jaycox, Richard L., 3,621,210.
Mitchell, Daniel M.; and Mehta, Chandrakant, 3,621,373.
Stoffer, C Daniel W., 3,621,473.
Stopka, Benjamin F.; Day, Dennis J.; Harmon, James V.; and Holt, Robert G., 3,620,631.
Collins, Wilbur W.; and Yost, Jack L., to Oil States Rubber Co. Disc type pipeline scraper and batch separator. 3,619,844, Cl. 15-104.06
Colt's Inc.:*See—*
Fremont, Robert D., 3,619,929.
Columbia Ribbon & Carbon Mfg., Co., Inc.: *See—*
Newman, Douglas A., 3,620,802.
Colvin, Oliver D.: *See—*
Colvin, Oliver D.; Taylor, Robert A.; and Kelly, Samuel C., 3,619,987.
Colvin, Oliver D.; Taylor, Robert A.; and Kelly, Samuel C., to Colvin, Oliver D. Devaporizing systems. 3,619,987, Cl. 55-196.
Combe, Gordon C. Metal cleaner. 3,619,962, Cl. 51-304.
Combustion Engineering Inc.: *See—*
Halloran, John J., Jr., 3,620,442.
Comis, William P.; and White, Lawrence E., to Dart Industries, Inc. Classification of dry polymer beads. 3,620,368, Cl. 209-2.
Commercial Shearing & Stamping Company: *See—*
Taradash, Samuel; and Chlumecky, Nicholas, 3,620,025.
Commissariat a l'Energie Atomique:*See—*
Valet, Jean-Yves, 3,621,382.
Commonwealth of Australia, The: *See—*
Hastwell, Peter J.; and Metcalfe, Kenneth A., 3,620,722.
Compagnie Generale d'Electricite:*See—*
Jules, Andre, 3,621,368.
Compagnie Pechiney: *See—*
Maurel, Pierre; and Duhart, Pierre, 3,620,671.
Compo Industries, Inc.: *See—*
Winkler, Julius G., 3,619,838.
Computer Electron Systems, Inc.: *See—*
Ahmann, John E., 3,620,587.
Comstock, Richard Lawrence; and Moore, Eugene B., to International Business Machines Corporation. Process for making continuous magnetite films. 3,620,841, Cl. 117-237.
Conant, John E.; and Buczek, Walter F., to Melpar, Inc. Visual simulation display system. 3,619,912, Cl. 35-12.
Cone, Clarence D., Jr.: *See—*
Loop, Russell W.; Tongier, Max, Jr.; and Cone, Clarence D., Jr.,3,620,595.
Conklin, Edward J., to Proctor & Gamble Company, The. Single phase composition. 3,620,712, Cl. 71-106.
Conklin, Robert M.; and Witucki, Ralph E., to Brunswick Corporation. Golf game. 3,620,537, Cl. 273-185.
Conlon, Ralph D.; and Fleisher, William M.,IV, to Nester & Faust Manufacturing Corporation. Material transport system. 3,620,134, Cl. 92-79.
Conradty, C.: *See—*
Reichelt, Bernhard; and Winter, Richard, 3,621,187.
Conrath, Louis R., to Detroit Coil Company. Solenoid having improved backstop. 3,621,421, Cl. 335-257.
Continental Can Company, Inc.: *See—*
Chiappe, Wayne T., 3,620,952.
Continental Oil Company: *See—*
Gordy, Travis L., 3,620,796.
Hood, Larry H.; Rose, LeRoy; and Starks, Charles M., 3,620,189.
Convers, Alain: *See—*
Jacques, Gabriel; Zuech, Alphonse; Convers, Alain; and Paumier, Jacques,3,621,068.
Cook, Russel P., to Polaroid Corporation. Novel products and processes for forming images in silver and in dye. 3,620,730, Cl. 96-3.
Cope, Richard P., Jr.: *See—*
Von Pless, James A.; and Cope, Richard P., Jr.,3,620,938.
Corbin, Edgar A., Jr., to Diamond Shamrock Corporation. Cheese manufacture. 3,620,768, Cl. 99-116.
Corderoy, Henry Morgan, to A.C.I. Operations Pty, Limited. Apparatus for handling sheet material and for applying successive coatings thereto. 3,620,187, Cl. 118-58.
Cordis Corporation: *See—*
Murphy, William P. Jr., 3,620,220.
Corhart Refractories Company: *See—*
McNally, Robert N.; and Patrick, Robert F., 3,620,782.
Corliss, Duncan Simmons; Keast, Russell Raymond; and Saxman, Richard Lewis, to FMC Corporation. Process of forming free-flowing, particulate mix- tures of phosphates and silicates. 3,620,979, Cl. 252-385.
Cornell, Dudley E., III. Filtering and moisture control device. 3,619,988, Cl. 55-234.

Corning Glass Works: *See—*
Carvie, Ronald C., 3,620,781.
DeKalb, Arthur; and Whitney, Alan G., 3,620,702.
Dockerty, Stuart M., 3,620,705.
Eckerlin, Herbert M., 3,621,229.
Evans, James W.; and Foster, Robert G., 3,620,703.

Cornwell, Woodrow D. Electrically heated footwear and handwear. 3,621,191, Cl. 219-211.

Cosby, Ira R., 50% to Kinert, Verlin R. Elastic band-resistance exercising device. 3,620,530, Cl. 272-82.

Cosgrove, Charlotte E.: *See—*
Jacobson, Charles R.; D'Adamo, Anthony; and Cosgrove, Charlotte E.,3,621,099.

Cottingham, David Alan, to Eastman Kodak Company. Receiving sheet for diffusion transfer processes. 3,620,728, Cl. 96-29.

Couch, Irvin Wayne. Trot line keeper. 3,619,933, Cl. 43-54.5

Courtaulds Limited: *See—*
Baker, Bernard Stuart, 3,621,418.

Cowen, Samuel H., to Chemed Corporation. Contoured neck towel. 3,619,816, Cl. 2-49.

Cox & Company, Inc.: *See—*
Barron, Benjamin, 3,621,331.

Cox, Paul D.; and Matchett, Joseph J., said Matchett, assor. to said Cox. Lug lock. 3,620,574, Cl. 301-9.

CPC International Inc.: *See—*
Germino, Felix J.; Kite, Francis E.; and Christensen, Edwin H., 3,620,842.
Parmerter, Stanley Marshall, 3,620,913.

Crabb, John A.: *See—*
Marquis, Theodore M.; and Crabb, John A.,3,620,434.

Crabtree Engineering Group (Colne) Limited: *See—*
Dent, Geoffrey Alan, 3,621,267.

Craig, Dwin R., to Brown, Elton H., Jr., mesne. Anti-glare light box. 3,621,231, Cl. 240-9.5

Crane, Paul J.; and Reese, Glenn A., to Magnavox Company, The. Developer apparatus for heat developing paper. 3,621,201, Cl. 219-388.

Crane, Walton B.; and Hawkinson, John, to Protective Packaging, Inc. Paperboard table. 3,620,175, Cl. 108-153.

Craven, George Frederick, to International Standard Electric Corporation. Waveguide filter. 3,621,483, Cl. 333-73.

Crell, Jesse D.; and Sze, Samuel, to Trade Bank and Trust Company, mesne. Closed loop processing apparatus. 3,620,373, Cl. 210-189.

Cremer, Joseph; Harnisch, Heinz; Schulte, Friedrich; and Hinz, Arnulf, to Knapsack Aktiengesellschaft. Process for the manufacture of mineral cattle food. 3,620,753, Cl. 99-2.

Crishal, Joan M.; and Rice, Edward J., to TRW Semiconductors Inc. Beam leads and method of fabrication. 3,620,932, Cl. 204-15.

Croce, Michele. Method of producing a dirt-resistant tile. 3,620,819, Cl. 117-123.

Crocker, Thomas H., to American Metal Climax, Inc. Automatic door operator. 3,619,946, Cl. 49-264.

Crompton & Knowles Corporation: *See—*
Nelson, Alden W., 3,619,859.

Crowe-Gulde Cement Company: *See—*
Gulde, Charles James, 3,621,086.

Crownover, Albert B., Jr.: *See—*
Brown, Morton E.; Williams, Darrell W.; and Crownover, Albert B., Jr.,3,620,077.

Crowson, Fred L., to Electrothermic Co., The. Method and apparatus for electrically heating a sub-surface formation. 3,620,300, Cl. 166-248.

Crowson, Robert L. Square link chains, and the manufacture thereof. 3,620,093, Cl. 74-250.

Crozier, Harold E. Automatic mailbox indicator. 3,620,444, Cl. 232-35.

Csakvary, Oscar: *See—*
Jureit, John C.; Csakvary, Oscar; Castillo, Adolfo; Kushner, Benjamin H.; and Karch, Otto J.,3,620,270.

CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Perucca, Giovanni, 3,621,147.

Cuff, David W., to American Optical Corporation. Unitary glass laser system with asymmetrical pumping. 3,621,457, Cl. 331-94.5

Cummings, Lowell O., to Pacific Vegetable Oil Corporation. Alkyds of unsaturated dibasic acids, polyols, and unsaturated fatty acid esters and method for making same; emulsion copolymerization of said alkyds with polymerizable monomers and the resulting polymers. 3,620,989, Cl. 260-22.

Cunningham, James W.; and Douglas, George R., to United States of America, Navy. Design of ultrasonic transducers for use with rolling mill rolls. 3,620,061, Cl. 72-199.

Cunningham, Robert A., to Hughes Tool Company. Rock drill with increased bearing life. 3,620,580, Cl. 308-8.2

Curnow, John W., to Sperry Rand Corporation. Power transmission. 3,620,247, Cl. 137-489.

Cutler-Hammer, Inc.: *See—*
Link, Donald A.; Hubertus, Wash; and Williams, Fred H., 3,621,189.
Mading, James E., 3,621,437.

Cutter, Paul R., to United States Steel Corporation, mesne. Ammoniated wet process phosphoric acid suspension base. 3,620,668, Cl. 23-107.

Czapla, Hansulrich: *See—*
Mahler, Ernst; Becker, Erich; Czapla, Hansulrich; Klasse, Fritz; and Ehrcke, Ulrich,3,620,783.

Czinczel, Armin: *See—*
Wehde, Heinz; Schindler, Kurt; Rogge, Joachim; and Czinczel, Armin,3,620,576.

Czompi, Joseph. Automobile windshield installer. 3,620,524, Cl. 269-21.

D'Adamo, Anthony:*See—*
Jacobson, Charles R.; D'Adamo, Anthony; and Cosgrove, Charlotte E.,3,621,099.

Dahm, Manfred; Neiderprum, Hans; and Simmler, Walter, to Farbenfabriken Bayer Aktiengesellschaft. Polyurethane catalysts. 3,620,984, Cl. 260-25.

Dahms, Ronald H.: *See—*
Anderson, George J.; and Dahms, Ronald H.,3,620,902.

Dahms, Ronald H.; and Anderson, George J., to Monsanto Company. Cold punchable cresylic laminates. 3,620,908, Cl. 161-248.

Daimler-Benz Aktiengesellschaft: *See—*
Breitschwerdt, Werner; and Andres, Rudolf, 3,620,198.
Forster, Hans-Joachim M.; and Eltze, Ulrich, 3,620,103.
Frey, Egon, 3,621,329.
Lamm, Heinz, 3,620,195.
Van Winsen, Friedrich H.; Trachte, Kurt; and Haverbeck, Gunther, 3,620,548.

Dain, Richard James, to Davy-Ashmore Limited. Continuous casting mold having a plurality of transverse cooling passages. 3,620,295, Cl. 164-283.

Daker, Horace Herbert; Martin, Raymond Alfred; and Rose, John, to British Insulated Callender's Cables Limited. Method of and apparatus for twisting together a plurality of elongated flexible elements. 3,620,001, Cl. 57-58.89

Dal Bianco, Bert L. Rivet removing tool. 3,620,635, Cl. 408-84.

Dal Pra, Giancarlo: *See—*
Barbieri, Ugo; and Dal Pra, Giancarlo,3,620,296.

Dalgleish, James, to Golden Wonder Limited. Apparatus for distributing powder. 3,620,423, Cl. 222-414.

Dalmo, Bror; Franked, John; Landhult, Hans; Nordberg, Birger; Ronnevig, Carl; and Tjernstrom, Ove, to Allmanna Svenska Elektriska Aktiebolaget. Damping winding for rotating pole system. 3,621,315, Cl. 310-183.

Daly, Richard T.; and Vambutas, Edmundas, to Quantronix Corporation. Proximity warning system for aircraft. 3,620,626, Cl. 356-4.

Dane, Dan H., to United States of America, National Aeronautics and Space Administration. Mechanically actuated triggered hand. 3,620,095, Cl. 74-469.

D'Angelo, Vito, to Vito-Bil, Inc. Glass washing device. 3,620,232, Cl. 134-56.

Danko, George K., to General Electric Company. Lead-in conductors for electrical devices. 3,621,111, Cl. 174-50.64

Dart Industries, Inc.: *See—*
Comis, William P.; and White, Lawrence E., 3,620,368.

Daugherty, Thomas Henry, to Bell Telephone Laboratories, Incorporated. Delta modulation information transmission system. 3,621,396, Cl. 325-38.

Daury, Claude, to Societe Anonyme dite: SOLEPHOT. Automatic photographic development apparatus. 3,620,152, Cl. 95-89.

Davidson, James R.; and Lagonegro, Paul R., to Xerox Corporation. Transfer drum withdrawal apparatus. 3,620,616, Cl. 355-3.

Davidsson, Per-Olof; and Hogberg, Karl Gosta, to Aktiebolaget Bofors. Closing device for the nozzle of a projectile furnished with a rocket-motor. 3,620,123, Cl. 89-1.8

Davies, John G., to Buckbee-Mears Company, mesne. Optical densitometer for measuring hole sizes in television masks. 3,620,627, Cl. 356-72.

Davies, Robert William: *See—*
Youngman, Derek Henry; and Davies, Robert William,3,620,874.

Davis, Jeannette. Eyeglass assembly. 3,620,608, Cl. 351-111.

Davis, Jerome W., to Mettler Electronics Corporation. Diathermy having meter circuit indicating true power drawn by a patient. 3,620,221, Cl. 128-422.

Davis, John Christopher Hammond; and Leathers, John William, to Plessey BTR Limited. Fluidic speed sensors. 3,620,087, Cl. 73-52.

Davis, Martin A.: *See—*
Santroch, George; and Davis, Martin A.,3,621,038.

Davis, Richard K., to General Electric Company. Gas turbine speed-load control. 3,620,010, Cl. 60-39.28

Davis, Robert D., to Spectral Dynamics Corporation. Electronic wave analyzer for determining the frequency and amplitude of components in a complex waveform. 3,621,388, Cl. 324-77.

Davis, Steven J., to General Datacom Industries. 332-014.. 3,621,470, Cl. 332-14.

Davis, Ward Benjamin, to Sterilizer Control Royalties. Disposable colorimetric indicator and sampling device for liquids. 3,620,676, Cl. 23-253.

Davison, Richard R.: *See—*
Harris, William B., Jr. (III); Harris, William B.; and Davison, Richard R.,3,620,206.

Davy and United Engineering Company Limited: *See—*
Ross, Keith, 3,620,067.

Davy-Ashmore Limited: *See—*
Dain, Richard James, 3,620,295.

Day, Dennis J.: *See—*
Stopka, Benjamin F.; Day, Dennis J.; Harmon, James V.; and Holt, Robert G.,3,620,631.

Day, George G.; and Bonilla, Charles F., to Haskett, Barry F. Natural circulation of cathode metal of electro- lytic cell. 3,620,942, Cl. 204-68.

Dayco Corporation: *See—*
Goldsberry, Eugene J., 3,619,966.
Dayton Progress Corporation: *See—*
Gargrave, Robert J., 3,620,113.
Deal, Bruce E., to Fairchild Camera and Instrument Corporation. Oxygen annealing. 3,620,850, Cl. 148-1.5
Dean, Jack Allen, to RCA Corporation. Monostable multivibrator. 3,621,297, Cl. 307-265.
Debus, Karl, to Linotype G.m.b.H. Device for production of a left-hand indention for cast lines. 3,620,360, Cl. 199-50.
De Coene, Robert, to Solvay & Cie. Resin compositions having a base of postchlorinated polyvinyl chloride and a process for the preparation thereof. 3,621,080, Cl. 260-897.
De Coye de Castelet, Gaetan, to Regie Nationale des Usines Renault. Electroplating a decorative chromium-plating resistant to corrosion. 3,620,936, Cl. 204-41.
Deere & Company: *See—*
Witzel, Homer D.; and Olieman, Pieter F., 3,620,223.
Deering Milliken Research Corporation: *See—*
Machell, Greville, 3,620,826.
Deffner, John F., to Gulf Research & Development Company. 2,6,7-Trioxa-1-arsabicyclo [2.2.2]octane compounds. 3,621,044, Cl. 260-440.
De Gaston, Raoul Hugh, to Valette, Henri L. Swivel chair. 3,620,494, Cl. 248-405.
Degener, Eberhart: *See—*
Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberhart; and Zecher, Wilfried,3,621,000.
Deibel, Raymond A.: *See—*
Papadatos, Dionysios D.; Deibel, Raymond A.; and Riester, William C.,3,619,847.
de Jaeger, Nikolaas Cyriel: *See—*
Tavernier, Bernard Hippoliet; de Jaeger, Nikolaas Cyriel; and Vanheertum, Johannes Josephus,3,620,721.
DeKalb, Arthur; and Whitney, Alan G., to Corning Glass Works. Process improvement for manufacturing high-purity quartz forms. 3,620,702, Cl. 65-18.
Delachapelle, Marcel Joseph Charles. Process for aluminothermal welding. 3,620,291, Cl. 164-108.
De Lara, Rudy. Rollable toy. 3,619,942, Cl. 46-220.
Demag Aktiengesellschaft: *See—*
Oppermann, Wilhelm; and Vogt, Johann, 3,619,897.
Demartres, Jean; and Teurnier, Roger, to C.I.T.-Compagnie Industrielle des Telecommunications. System for automatically charging telegraphic communications. 3,621,120, Cl. 178-2.
Denis, Michel; and Barillot, Maurice, to Institut de Recherches de la Siderurgie Francaise, and Societe Chimique des Charbonnages. Method and apparatus for chemically transforming gases. 3,620,946, Cl. 204-171.
Denker, Ernst: *See—*
Bartel, Gunter Friedrich; Klawitter, Martin; and Denker, Ernst,3,620,680.
Denki Onkyo Co., Ltd.: *See—*
Yabase, Koji, 3,621,416.
Dennler, Bernd: *See—*
Fruhstorfer, Wolfgang; Namenyi, Istvan; Baumer, Wilhelm; and Dennler, Bernd,3,621,034.
Dent, Geoffrey Alan, to Crabtree Engineering Group (Colne) Limited. Method and apparatus for detecting a break in longitudinally moving yarn. 3,621,267, Cl. 250-219.
Dentino, Emma L. Pole lamp table. 3,620,174, Cl. 108-151.
Deprez, Louis: *See—*
Bourlet, Claude; and Deprez, Louis,3,620,260.
Desalination Systems, Inc.: *See—*
Brown, Ross M., 3,620,241.
Deschamps, Andre: *See—*
Renault, Philippe; Falcon, Serge; Chavin, Jean-Claude; and Deschamps, Andre,3,620,674.
Desco-Werk Seger & Angermeyer KG: *See—*
Angermeyer, Wolfgang, 3,621,336.
Deseret Pharmaceutical Company, Inc.: *See—*
Santomieri, Louis S., 3,620,500.
Detroit Coil Company: *See—*
Conrath, Louis R., 3,621,421.
Deutsch, Fritz A., to Addressograph-Multigraph Corporation. Embossing device with dies mounted on flexible fingers. 3,620,343, Cl. 197-6.7
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Lea, Hans, 3,620,508.
Thiele, Kurt, 3,621,052.
Winter, Karl-Heinz; and Krach, Ottwin, Wolfgang Bei, 3,620,518.
Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See—*
Schwarze, Werner, 3,620,710.
DeVaughn, Donald H. Sterile test tubes. 3,620,679, Cl. 23-259.
Dewan, Shashi B.: *See—*
Duff, David L.; and Dewan, Shashi B.,3,621,366.
De Winter, Walter F.; and Preston, Jack. Block polyheterocyclic elastomers having high thermal resistance. 3,621,076, Cl. 260-857.
DHJ Industries Inc.: *See—*
Feitlowitz, Robert D., 3,620,797.
Diagravure Film Mfg. Corporation: *See—*
Ulano, Bernard, 3,620,735.
Diamond Shamrock Corporation: *See—*
Corbin, Edgar A., Jr., 3,620,768.
Dibble, Merton L., to Eastman Kodak Company. Method and apparatus for assimilating a yarn end in tow. 3,619,868, Cl. 19-65.
Dick, Rudolf, to Goltermann, Wandel U. Resonant network with reactively coupled FET providing linear voltage/frequency response. 3,621,471, Cl. 332-16.
Dict-O-Tape Inc.: *See—*
Knox, Austin A., 3,620,480.
Didier-Werke A.G.: *See—*
Mahler, Ernst; Becker, Erich; Czapla, Hansulrich; Klasse, Fritz; and Ehrcke, Ulrich, 3,620,783.
Diehr, Hans Joachim; Merten, Rudolf; Piechota, Helmut; and Uhlig, Konrad, to Farbenfabriken Bayer Aktiengesellschaft. Synthetic resins comprising reaction products of isocyanates and process for their production. 3,620,986, Cl. 260-2.5
Diener, Horst: *See—*
Lohmann, Harald; and Diener, Horst,3,620,825.
Dietzler, Andrew J.: *See—*
Noddings, Charles R.; Dietzler, Andrew J.; and Gates, Ronald G.,3,621,071.
Digital Equipment Corporation: *See—*
St. Amour, Joseph, 3,620,468.
Dijksterhuis, Popko Reinder; and Rust, Robert, to U.S. Philips Corporation. Device for electrophoretic analysis using a capillary tube with detection means. 3,620,958, Cl. 204-299.
Dille, Roger M.: *See—*
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P.,3,620,698.
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P.,3,620,700.
Dilot, Rolf Magnus: *See—*
Benzon-Petersen, Boye; and Dilot, Rolf Magnus,3,620,871.
Dimeff, John; and Lane, James W., to United States of America, National Aeronautics and Space Administration. Wide range dynamic pressure sensor. 3,620,083, Cl. 73-398.
Dinger, Edward H., to General Electric Company. Inverter control system for AC motor with pulse locked closed loop frequency multiplier. 3,621,352, Cl. 318-227.
Dinger, Edward H., to General Electric Company. Double half wave motor control. 3,621,355, Cl. 318-345.
Dischler, Helmut, to Novopress GmbH & Co., Kg. Variable-diameter crimping tool. 3,619,885, Cl. 29-203.
Dixon Automatic Tool, Inc.: *See—*
Dixon, Paul H., 3,620,106.
Dixon, Frederick Charles: *See—*
Sindall, John Henry; and Dixon, Frederick Charles,3,620,237.
Dixon, Paul H., to Dixon Automatic Tool, Inc. Wrench-type socket. 3,620,106, Cl. 81-121.
DMZ 'LENIN': *See—*
Valchev, Alexander Yordanov; and Tashev, Kyril Hristov, 3,621,104.
Dockert, Stuart M., to Corning Glass Works. Method and apparatus for feeding molten glass. 3,620,705, Cl. 65-129.
Dodge, William S. Hoisting apparatus for handling cargo. 3,620,427, Cl. 214-15.00r
Dodgen Industries, Inc.: *See—*
Dodgen, John N.; and Swigger, Paul C., 3,620,154.
Dodgen, John N.; and Swigger, Paul C., to Dodgen Industries, Inc. Livestock feed processing apparatus. 3,620,154, Cl. 99-235.
Doebel, Karl J.: *See—*
Watthey, Jeffrey W. H.; and Doebel, Karl J.,3,621,098.
Doerfel, Helmut: *See—*
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; Jeserich, Wolfgang-Dieter; and Reichel, Bernd,3,621,001.
Dold, Otto: *See—*
Berger, Herbert; Dold, Otto; Kruger, Dietrich; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald,3,621,016.
Domine, Daniel; and Hay, Leon, to L'Air Liquide, Societe Anonyme pour l'Etude & l'Exploitation des Procedes Georges Claude. Gas separation by adsorption. 3,619,984, Cl. 335-150.
Domyan, Frank F.: *See—*
Keller, William F.; and Domyan, Frank F.,3,620,185.
Donat, Frank J., to Goodrich, B. F., Company, The. Solvent resistant thermoplastic polymers. 3,621,077, Cl. 260-879.
Donka N.V.: *See—*
Kennington, Arnold Reginald, 3,620,153.
Donnithorne, William C., to Algoma Steel Corporation, Limited, The. Storage and display device. 3,620,363, Cl. 206-45.15
Donovan, Marion. Combined check and record-keeping book. 3,620,553, Cl. 282-8.
Dooley, Peter C., Jr., to Carborundum Company, The. Pulpstone mounting. 3,620,462, Cl. 241-294.
Door, Wesley R., to USM Corporation. Pliers. 3,620,108, Cl. 81-341.
Doran, Richard S.; and Barstrom, Knut A. Controller for label printer and dispenser. 3,620,161, Cl. 101-291.
Dostal, Frank, to Bulova Watch Company, Inc. Amplitude limiter for tuning fork oscillator. 3,621,467, Cl. 331-109.
D'Ottavio, Eugene D.: *See—*
Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S.,3,620,933.
Douglas, Daryl D.: *See—*
Wenger, Jerry A.; Douglas, Daryl D.; Urch, Harvey M.; Nordman, Leonard; and Polivka, John N.,3,620,564.
Douglas, George R.: *See—*
Cunningham, James W.; and Douglas, George R.,3,620,061.

Dow Chemical Company, The: *See—*
Anderson, Richard W.; and Merrill, Claude I.,, 3,621,066.
Hatch, Melvin J., 3,620,786.
Hradel, Joseph R.; and Staadt, Harold E., 3,620,858.
King, Stanley T., 3,620,186.
Noddings, Charles R.; Dietzler, Andrew J.; and Gates, Ronald G., 3,621,071.
Root, Roland L.; and Eilers, Louis H., 3,620,785.
Slykhouse, Thomas E., 3,620,084.
Tolkmith, Henry; Seiber, James N.; and Budde, Paul B., 3,621,031.

Dow Corning Corporation: *See—*
Kim, Yung Ki; and Pierce, Odgen R., 3,620,992.

Dowley, Mark W.: *See—*
Rorden, Robert J.; Dowley, Mark W.; and Mefferd, Wayne S.,3,621,273.

Dowty Rotol Limited: *See—*
Masterman, John Michael, 3,621,350.

Doyle, Maura Jean, to Bunny Bear, Inc. Crib bumper. 3,619,824, Cl. 5-93.

Drabert Sohne: *See—*
Riedel, Dieter, 3,620,051.

Dravo Corporation: *See—*
Forbes, Frank, 3,620,519.

Dreitzler, David R.; Thorn, Lawrence B.; and Yell, Roy E., to United States of America, Army. Peltier controlled bolometer themperature reference technique. 3,621,258, Cl. 250-83.3

Dresser Industries, Inc.: *See—*
Bohn, Floyd O., 3,620,314.

Drews, Reinhold A.; and Trembath, Robert S., to Whirlpool Corporation. Liquid dispenser for automatic washing machine. 3,620,054, Cl. 68-17.

Driller, Josef, to Friedrich Uhde GmbH. Device for the detachment of built-up granular mass. 3,619,909, Cl. 34-164.

Driskell, Carl R., to United States of America, Navy. Periscope stadimeter simulator with video delay. 3,621,128, Cl. 178-6.8

Drittler, Karl; and Luhleich, Hartmut, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt m.b.H. Method of making nuclear fuel elements. 3,620,835, Cl. 117-215.

Dudderar, Thomas Dixon; and O'Regan, Richard, to Bell Telephone Laboratories, Incorporated. Interferometry of transparent objects. 3,620,589, Cl. 350-3.5

Duez, Jean: *See—*
Mormont, Rene; and Duez, Jean,3,619,986.

Duff, David L.; and Dewan, Shashi B., to Marathon Electric Research of Canada, Ltd. D.C. side commutated chopper and inverter. 3,621,366, Cl. 321-45.

Duff, Harold H., to Entwistle Company, The. Wire coiling apparatus. 3,620,470, Cl. 242-82.

Duffy, James J., to Hooker Chemical Corporation. Metal plating of substrates. 3,620,834, Cl. 117-213.

Duhart, Pierre: *See—*
Maurel, Pierre; and Duhart, Pierre,3,620,671.

Duhl, David N.: *See—*
Wagner, David H.; Duhl, David N.; Van Der Molen, Edward H.; and Sullivan, Cornelius P.,3,620,855.

Dumbri, Austin C.: *See—*
Clark, Conrad A.; Dumbri, Austin C.; and Roberts, James F.,3,620,814.

Dunaway, J. C., to United States of America, Army. Fluidic gyro caging and nulling device. 3,620,089, Cl. 74-5.6

Dunlop Holdings Limited: *See—*
Brooke, Thomas A.; and Neller, William C., 3,620,346.
Folkes, Hugh L., 3,620,357.

Dunn, Harold George, to Hoover Company, The. Spin dryers. 3,620,053, Cl. 68-23.5

Dunn, William G.: *See—*
Rogers, James H.; and Dunn, William G.,3,620,013.

Du Plessis, Edward A. Portable folding sleeper unit. 3,620,235, Cl. 135-1.

Du Pont de Nemours, E. I., and Company: *See—*
Ahramjian, Leo, 3,620,905.
Bartlett, Philip Lee, 3,621,059.
Boswell, George Albert, Jr., 3,621,010.
Bunting, William Wallar, Jr.; Evans, Franklin James; and Hook, David Ellis, 3,620,903.
Carmichael, Keith Stewart, 3,619,910.
Chu, Victor Fu-Hua; and Manger, Charles Walter, 3,620,726.
Harris, Roland G.; and Ryan, Joseph Henry, Jr., 3,620,898.
Moore, Earl P., Jr., 3,620,978.
Ojakaar, Leo, 3,621,020.
Ross, John M.; and Stryker, Harvey I., 3,621,008.
Short, Oliver A., 3,620,713.
Short, Oliver A., 3,620,714.
Simms, John A., 3,620,417.
Yuan, Edward L., 3,620,907.

Durand, John E., to International Telephone and Telegraph Corporation. Switching device. 3,621,168, Cl. 200-84.

Durand Machine Works Ltd.: *See—*
Tyler, Reginald E. W.; and Carter, Paul M., 3,620,527.

Duriron Company, Inc., The: *See—*
Bowen, John C., 3,620,251.

Durr, Alfred W.; Gunsser, Otto; and Heller, Hubert H., to Gebruder Heller Maschinenfabrik GmbH. Machine tool with facing tool slide for automatic tool changing. 3,620,109, Cl. 82-2.

Dusheck, George J., Jr., to United States of America, Navy. Level detector. 3,621,308, Cl. 307-318.

Duvendack, William H., to Joslyn Mfg. and Supply Co. Line pole grounding system. 3,621,107, Cl. 174-6.

Dwight, Henry R. Headlamp mounting means. 3,621,230, Cl. 240-7.1

Dyers, O. B., Inc.: *See—*
Oberholtzer, Robert M., 3,619,831.

Dynabrade, Inc.: *See—*
Welsch, Walter N.; and Buchman, Louis J., 3,619,949.

Dynamit Nobel Aktiengesellschaft: *See—*
Neidhardt, Manfred; and Schneider, Joseph, 3,621,204.
Wienand, Michael, 3,619,856.

Eagles, Geoffrey James: *See—*
Ingram, David John; and Eagles, Geoffrey James,3,620,383.

Eastern Air Lines Inc.: *See—*
Rush, David H.; and Williams, Wayne E., 3,621,383.

Eastern Steel Products Ltd.: *See—*
Rath, Albert, 3,620,458.

Eastman Kodak Company: *See—*
Barr, Charles R., 3,620,746.
Chandler, Jasper S., 3,620,146.
Cottingham, David Alan, 3,620,728.
Dibble, Merton L., 3,619,868.
Etter, Doyle Owen; and Killick, Merrill Wilfred, 3,620,737.
Gray, William C., Jr., 3,620,739.
Haist, Grant M.; Humphlett, Wilbert J.; and King, James R., 3,620,749.
Marchant, John C.; and Motter, Robert F., 3,620,747.
Seymour, Merrill W., 3,620,745.
Tarkington, Raife G., 3,620,736.
White, Walter R., 3,620,790.

Eaton Yale & Towne, Inc.: *See—*
Schaff, Paul W., 3,620,497.

Eberwein, Helmut; and Steigerwald, Wolf-Erhard. Slide resistor. 3,621,440, Cl. 338-183.

Eckardt, Carl R.; Barton, Oliver Alfred; and Hetterly, Ralph Milton, to Allied Chemical Corporation. Bonding metals with chlorinated ethylene polymers. 3,620,860, Cl. 156-247.

Eckberg, Eric A. Removable box bail. 3,619,852, Cl. 16-114.

Eckel, Heinrich, Firma: *See—*
Korger, Heinz; and Eckel, Heinrich, 3,620,545.

Eckel, Heinrich: *See—*
Korger, Heinz; and Eckel, Heinrich,3,620,545.

Eckenbrecht, Robert Roy; and Scott, Benton Boyd, to GTE Sylvania Incorporated. Continuous electronic film scanner. 3,62?,121, Cl. 178-5.2

Eckerlin, Herbert M., to Corning Glass Works. Fluidic binary comparator utilizing threshold gates. 3,621,229, Cl. 235-201.

Eckert, Rudolf J. A., to Shell Oil Company. Copolymer of an alkene, an alkyl ester of an unsaturated carboxylic acid and a hydroxyalkyl ester of an unsaturated carboxylic acid. 3,621,004, Cl. 260-80.75

Eckfeldt, Edgar L., to Leeds & Northrup Company. Coulometric system having compensation for temperature induced viscosity changes. 3,621,381, Cl. 324-30.

Economics Laboratory, Inc.: *See—*
Miller, Carl A., 3,620,231.

Economy, James; and Anderson, Raymond V., to Carborundum Company, The. Boron nitride fiber manufacture. 3,620,780, Cl. 106-55.

Eddy, William C., Jr., to Industrial Nucleonics Corporation. Process and apparatus for defect detection using a radioactive isotope. 3,621,252, Cl. 250-71.5

Edelmann, E., & Co.: *See—*
Weber, John F., Jr., 3,620,056.

Edgar, Owen Burchell; and Yates, Michael Richard, to Imperial Chemical Industries Limited. Process for spinning dye-resistant copolyamide filaments. 3,621,089, Cl. 264-211.

Edwards High Vacuum International Limited: *See—*
Emery, John Arthur Alfred; Jackson, Geoffrey Norman; and Priestland, Colin Richard Douglas, 3,620,957.

Edwards, William R., to United States of America, Navy. Force gage (pilot's). 3,620,075, Cl. 73-141.

Eggenmuller, Alfred; Scherer, Lorenz; Bellan, Heinrich; and Wohrle, Rudolf, to Gebruder Eberhardt. Apparatus connectible to a tractor or agricultural vehicle. 3,619,995, Cl. 56-13.4

Eggert, Walter S., Jr.; and Herring, James M., Jr., to Boothe Airside Services, Inc., mesne. Aircraft passenger transfer vehicle. 3,620,565, Cl. 296-28.

Eggler, Karl W.: *See—*
Waddell, Raynor J.; and Eggler, Karl W.,3,620,041.

Egyesult Gyogyszer es Tapszergyar: *See—*
Benko, Pal; Budai, Zoltan; and Pallos, Laszlo, 3,621,061.

Ehrcke, Ulrich: *See—*
Mahler, Ernst; Becker, Erich; Czapla, Hansulrich; Klasse, Fritz; and Ehrcke, Ulrich,3,620,783.

Ehret, Gordon F., to Swimquip, Inc. Skim tank. 3,620,372, Cl. 210-169.

Ehrreich, John E.; and Reti, Adrian R., to Ercon, Inc. Making metal-plastic gasket materials. 3,620,873, Cl. 156-250.

Eilers, Louis H.: *See—*
Root, Roland L.; and Eilers, Louis H.,3,620,785.

Eilertson, Earl E., 1/3 to Eilertson, Eugene Earl, and 1/3 to Vie, Arnold M. Extinguishing ashtray. 3,620,226, Cl. 131-235.

Eilertson, Eugene Earl: *See—*
Eilertson, Earl E., 3,620,226.

Einfalt, Alfred,, to Gebruder Einfalt Blechspielwarenfabrik. Simulated gun and target which is struck from behind to indicate correctness of aim. 3,620,534, Cl. 273-101.2

Eisenbach, Wilhelm: *See—*
Ziegler, Karl; and Eisenbach, Wilhelm,3,620,954.

Eisner, Ira Leonard. Package for resilient elements or those stored under spring pressure. 3,620,412, Cl. 221-58.

Eizo Komiyama: *See—*
Kikumoto, Tomichi, 3,621,249.

Ejectoret S.A.: *See—*
Gruska, Ralph, 3,620,632.

Eklund, Henrik J.; and Seaquist, Alfred J., to Beloit Corporation. Wet depithing of a non-woody lignocellulosic plant material. 3,620,911, Cl. 162-96.

Ekstrom, Bertil Ake: *See—*
Bamberg, Peter; Ekstrom, Bertil Ake; and Sjoberg, Berndt Olof Harald,3,621,029.

Elco Corporation: *See—*
Stein, Max M., 3,621,444.

Electrolytic Zinc Company of Australia Limited: *See—*
Bratt, Geoffrey Charles; and Brown, Dereck Wilson, 3,620,670.

Electronic Associates, Inc.: *See—*
Bryndza, Robert M.; and Wiersma, Fonger, 3,621,464.

Electronic Memories and Magnetics Corporation: *See—*
Brumm, Wayne R., 3,621,371.

Electrothermic Co., The: *See—*
Crowson, Fred L., 3,620,300.

Elger, Ronald John; and Cameron, Ian Lewis, to Fielding Plant Design Limited. Extrusion presses. 3,620,064, Cl. 72-272.

Eli Lilly and Company: *See—*
Kwok, Russell; and Pohland, Albert, 3,621,041.

Ellinger, Rudolph H.; and Schwartz, Mark G., to Stauffer Chemical Company. Replacement of sodium caseinate. 3,620,757, Cl. 99-54.

Elmore, Lester C.; and Broxholm, Thomas M., to Pulsepower Systems Incorporated. Pulsed high pressure liquid propellant combustion powered liquid jet drills. 3,620,313, Cl. 175-14.

Elsner, Albercht; and Klipping, Gustav, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften ev. Cryostat device. 3,620,033, Cl.

Elson, Ronald D.; and Krenke, Norman O., to Baker Perkins Inc. Hook type pallet unstacker with doubles eliminator. 3,620,387, Cl. 214-8.5

Eltze, Ulrich: *See—*
Forster, Hans-Joachim M.; and Eltze, Ulrich,3,620,103.

Elwell, Maurice W. Washing machine packing brace. 3,620,365, Cl. 206-46.

EMA Corporation: *See—*
Guglielmo, Richard J., Sr.; and Chookazian, Nishan G., 3,620,875.

Emery, John Arthur Alfred; Jackson, Geoffrey Norman; and Priestland, Colin Richard Douglas, to Edwards High Vacuum International Limited. Targets for radio frequency sputtering apparatus. 3,620,957, Cl. 204-298.

Emery, Vernon V. Machine for drawing extruded plastic tubing or rod from an extruder. 3,620,432, Cl. 226-172.

Endle, Joseph, to Societe a Responsabilite Limitee Centre de Recherches du Fer Blanc. Method of electrolytic tinning sheet steel. 3,620,934, Cl. 204-34.

Endo Laboratories Inc.: *See—*
Schoen, Karl; and Finizio, Michael, 3,621,027.

Engborg, Nelson E.: *See—*
Barnes, Robert Bowling; and Engborg, Nelson E.,3,621,253.

Engelsmann, Dieter; and Pawlik, Gunter, to Agfa-Gevaert Aktiengesellschaft. Illuminating control arrangement for photographic cameras. 3,620,142, Cl. 95-10.

English Electric Valve Company Limited: *See—*
Clayworth, Geoffrey Thomas, 3,621,316.

English, Jackson Pollard: *See—*
Miller, Bernard; and English, Jackson Pollard,3,621,021.

Enlow, William P.: *See—*
Hechenbleikner, Ingenuin; Hussar, John F.; Koeniger, Arthur F.; and Enlow, William P.,3,621,051.

Ensign-Bickford Company, The: *See—*
Bratton, Francis H.; and Smith, John M., 3,620,166.

Entwicklungsring Sud GmbH: *See—*
Sturm, Rolf Gustav, 3,620,557.

Entwistle Company, The: *See—*
Duff, Harold H., 3,620,470.

Eppendorf Geraetebau Netheler & Hinz GmbH: *See—*
Netheler, Heinrich; Bergmann, Wilhelm; and Bechtler, Gunter, 3,621,215.

Epstein, James; and Liang, Charles C., to Mallory, P. R., & Co., Inc. Alkaline dry cell and permanganate cathode therefor. 3,620,848, Cl. 136-138.

Epstein, Max; Fryberger, David; Serafin, Robert J.; and Van Den Heuvel, Anthony P., to IIT Research Institute. Information display system. 3,621,328, Cl. 315-55.

Erby, William A.; and Walde, Robert A., to Air Products and Chemicals Inc. Cotton harvesting methods and compositions. 3,619,991, Cl. 56-1.

ERC Electronic Research Corporation: *See—*
Hinrichs, Kurt; and Wilken, Gerd, 3,621,358.

Ercon, Inc.: *See—*
Ehrreich, John E.; and Reti, Adrian R., 3,620,873.

Erdahl, Alan C.: *See—*
Romney, Gordon W.; Evans, David C.; Erdahl, Alan C.; Wylie, Chris R., deceased; and Wylie, Patricia A.; administratrix,3,621,214.

Erickson, Charles R.; and Seibold, Glenn C. Plow bottom cover. 3,620,309, Cl. 338-2.

Eriksson, Erik Helmer; Hogberg, Lars-Gunnar; Kempe, Carl Peter Seth; and Lofgren, Stig-Gunnar, to Mo och Domsjo Aktiebolag. Method and machine for felling, debranching, collecting and bundling trees. 3,620,272, Cl. 144-3.

Erkenbrack, Lorraine V.: *See—*
Brown, Archer W.; Montgomery, James L.; and Erkenbrack, Lorraine V.,3,620,579.

Ernst, Max. Coupling for toy and model railroads. 3,619,941, Cl. 46-216.

Escursell-Prat, Roberto. Yarn piecing apparatus. 3,619,999, Cl. 57-34.

Eshleman, Lindley H.: *See—*
Svoboda, Glenn R.; Singleton, Fred G.; and Eshleman, Lindley H.,3,621,093.

Essex Recon Corporation: *See—*
Birch, David W., 3,619,864.

Esso Research and Engineering Company: *See—*
Hollyday, William C., Jr.; and Feldman, Nicholas, 3,620,696.
King, Laurence F., 3,620,995.

Estes, Robert S.,: *See—*
Fonda-Bonardi, Giusto, 3,620,017.

Estes, Robert T.: *See—*
Slade, Philip E.; Estes, Robert T.; and Randall, James C.,3,620,824.

Etablissement Ruggieri: *See—*
Robinet, Jean, 3,619,927.

Etablissements Clin-Byla Paris: Ugine-Kuhlmann: *See—*
Laboureur, Pierre; Brunaud, Marcel D. P.; and Langlois, Claude, 3,620,923.

Ethyl Corporation: *See—*
Lombardi, Eugene H., 3,621,341.
Zatopek, Edward J.; and Bitting, James L., 3,620,243.

Etter, Doyle Owen; and Killick, Merrill Wilfred, to Eastman Kodak Company. Etching of differentially hardened plates by enzymes. 3,620,737, Cl. 96-36.3

European Atomic Energy Community (Euratom): *See—*
Gualandi, Dante; and Jehenson, Pierre, 3,619,894.

Eutectic Corporation: *See—*
Broderick, John P.; Wishnie, Frederick T.; and Keys, Don L., 3,620,454.
Joseph A David, 3,621,188.

Evans, Chandler, Inc.: *See—*
Bright, Lawrence S., 3,620,239.

Evans, David C.: *See—*
Romney, Gordon W.; Evans, David C.; Erdahl, Alan C.; Wylie, Chris R., deceased; and Wylie, Patricia A.; administratrix,3,621,214.

Evans, David John Ivor: *See—*
Zubryckyj, Nicolas; and Evans, David John Ivor,3,620,669.

Evans, Dennis J.: *See—*
Blecherman, Sol S.; Bala, Mitchell J.; Evans, Dennis J.; and Ulion, Nicholas E.,3,620,815.

Evans, Franklin James: *See—*
Bunting, William Wallar, Jr.; Evans, Franklin James; and Hook, David Ellis,3,620,903.

Evans, James P. Speed wrench. 3,620,107, Cl. 81-125.1

Evans, James W.; and Foster, Robert G., to Corning Glass Works. Method of fabricating glass orifice plates. 3,620,703, Cl. 65-42.

Evans, Joseph H.; and Weir, Fred Eugene, to Raychem Corporation. Pull tab and pressure relief valve. 3,620,406, Cl. 220-44.

Everroad, Herbert L. Air filter cleaning apparatus. 3,620,234, Cl. 134-86.

Ex-Cell-O Corporation: *See—*
Nitkiewicz, Joseph; and Mendelsohn, Nathan, 3,620,131.
Nitkiewicz, Joseph, 3,620,132.

Fairchild Camera and Instrument Corporation: *See—*
Deal, Bruce E., 3,620,850.
Rogers, Bryant C.; and Wakely, Wilbur T., 3,621,338.

Falcon, Serge: *See—*
Renault, Philippe; Falcon, Serge; Chavin, Jean-Claude; and Deschamps, Andre,3,620,674.

Falkenstein, Georg: *See—*
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; Jeserich, Wolfgang-Dieter; and Reichel, Bernd,3,621,001.

Fannon, Robert D., Jr.; Lower, Brenton R.; and Laufe, Leonard E., said Fannon and said Lower assors. to said Laufe, mesne. Intrauterine contraceptive device. 3,620,212, Cl. 128-130.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Dahm, Manfred; Neiderprum, Hans; and Simmler, Walter, 3,620,984.
Diehr, Hans Joachim; Merten, Rudolf; Piechota, Helmut; and Uhlig, Konrad, 3,620,986.
Golitz, Hans Dietrich; Simmler, Walter; and Schwabe, Peter, 3,621,047.
Kruckenberg, Winfried, 3,620,663.
Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberhart; and Zecher, Wilfried, 3,621,000.
Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm, 3,621,082.

Wagner, Otto; Bauer, Klaus; Kaufmann, Wilfried; Rauenbusch, Erich; Arens, Alfred; and Irion, Eckart, 3,620,926.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Gossel, Hartmut; Merkle, Kurt; and Memmel, Ferdinand, 3,620,793.
Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Stache, Ulrich, 3,621,015.
Stache, Ulrich; Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Schroder, Hans-Georg, 3,621,014.

Farbwerke Hoechst Aktiengesellschaft vormals Meister: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,621,057.
Winkelmann, Ehardt; and Raether, Wolfgang, 3,621,013.

Farge, Daniel; Moutonnier, Claude; and Messer, Mayer Naoum, to Rhone-Poulenc S.A. Benzofuran derivatives. 3,621,037, Cl. 260-343.3

Farinon Electric: *See—*
Ho, Eugene Y., 3,621,452.

Farkas, Otto: *See—*
Bartha, Zoltan; Vad, Laszlo; Biro, Imre; and Farkas. Otto,3,620,279.

Farmer, Robert S., Sr., to Westinghouse Electric Corporation. Method for uprighting electrical inductive apparatus. 3,620,395, Cl. 214-152.

Fauchere, Jean. Telescopic jib with a telescopic inclinable end member for cranes. 3,620,379, Cl. 212-55.

Faure, Marc; and Arsandaux, Louis, deceased0 (by Arsandux, Marthe Marie Louis; legal representative), to Societe d'Etudes et de Deveoppement des Aeroglisseurs Marins Terrestres et Amphibies S.E.D.A.M. Deformable skirting system for surface effect machine. 3,620,325, Cl. 180-127.

Faust, John P.; Jache, Albert W.; and Klanica, Andrew J., to Olin Mathieson Chemical Corporation. Preparation of alkali metal hexafluorochlorates. 3,620,689, Cl. 23-367.

Fawcett, James W.; Irwin, John M.; and McFadyen, Robert J., to General Electric Company. D. C. motor current actuated digital control system. 3,621,354, Cl. 318-341.

Feder, Friedhelm R., to Wedco, Inc. Disc mill. 3,620,463, Cl. 241-255.

Federal Auto Products Co., Inc.: *See—*
Philipps, Virgil, 3,620,414.

Feitlowitz, Robert D., to DHJ Industries Inc. Impregnation of a non-woven fabric. 3,620,797, Cl. 117-7.

Feldman, Nicholas: *See—*
Hollyday, William C., Jr.; and Feldman, Nicholas,3,620,696.

Ferdinand, Harry, Jr. Removably attached vehicular head lamp glare diffusing filter. 3,621,233, Cl. 240-46.59

Ferdinand, Irwin J.; and Kulbersh, Irwin R., to Hirsh Company, The. Trim fastenings for shelving unit. 3,620,176, Cl. 108-153.

Ferdinand, Irwin J.; and Kulbersh, Irwin R., to Hirsh Company, The. Door closure for shelving. 3,620,588, Cl. 312-323.

Ferguson, Lowell D.; and Carrico, John P., to Bendix Corporation, The. Dynamic field time of flight mass spectrometer. 3,621,242, Cl. 250-41.9

Ferranti Limited: *See—*
Alford, Derek William, 3,620,088.

Ferrofluidics Corporation: *See—*
Rosensweig, Ronald E., 3,620,584.

Ferroxcube Corporation of America: *See—*
Hagen, Thomas E., 3,621,281.

Feucht, Jacob E., to Westinghouse Air Brake Company. Heat dissipating bearing with wear compensating means. 3,620,133, Cl. 92-33.

Fibreboard Corporation: *See—*
Morse, Hugh B.; and Foster, Thomas W., 3,620,439.
Theys, Ezra E.; Morse, Hugh B.; and Johnson, Robert B., 3,619,977.

Fichter, Harry L., Jr., to Horizons Incorporated. N-vinyl amine/halogen liberating composition sensitized with 9-vinyl carbazoles or polyacenes, or transannular peroxides of polyacenes. 3,620,748, Cl. 96-48.

Field, Stanely: *See—*
Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Field, Stanely,3,620,729.

Fielding Plant Design Limited: *See—*
Elger, Ronald John; and Cameron, Ian Lewis, 3,620,064.

Figueroa, Carlos G., to Industrial Nucleonics Corporation. Method of forming a patterned radiation source. 3,620,794, Cl. 117-5.5

Film Equipment Manufacturing Co.: *See—*
Hanline, John V.; and Chapin, Daniel M., 3,621,225.

Filton Limited: *See—*
Walker, Gordon Richard; and Murray, William, 3,620,253.

Finhill, Mort: *See—*
Ref, Josef; and Finhill, Mort,3,621,114.

Finizio, Michael: *See—*
Schoen, Karl; and Finizio, Michael,3,621,027.

Fink, Joel H., to Westinghouse Electric Corporation. High power cathode. 3,621,324, Cl. 313-338.

Finn, Frederick George; and Gaut, Charles John, to Post Office, The. Wire wrapping tools. 3,619,829, Cl. 7-14.1

Finn Industries Division, Potlatch Forests, Inc., The: *See—*
Adams, Leonard, Jr., 3,620,436.

Finney, Robert R.; Luckenbill, Lawrence F.; and Kissell, Gerry E., to Mueller Co. Perforator and apparatus for using same. 3,620,245, Cl. 137-318.

Firestone Tire & Rubber Company, The: *See—*
Kibler, Richard W., 3,621,090.

Fischback, Eric. Grinding attachments for surface grinders. 3,619,955, Cl. 51-237.

Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Urea derivatives and methods for controlling unwanted plant growth. 3,621,055, Cl. 260-545.

Fischer, Adolf: *See—*
Zeidler, Adolf; Koenig, Karl-Heinz; Fischer, Adolf; and Jung, Johann,3,621,017.

Fischer, Christoph, to Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher 'Weser' Flugzeugbau/ Focke-Wulf/Heinkel-Flugzeugbau. Device for reducing the sound of the turbine plant in airplanes. 3,620,487, Cl. 244-55.

Fischer, Raymond C., to International Harvester Company. Earth moving explosive device. 3,619,917, Cl. 37-1.

Fisher, Colin, to Metals Research Limited. Detection devices for image analysis systems. 3,621,129, Cl. 178-6.8

Fite, Ellis Glenn, to Stauffer Chemical Company. Method of agglomerating finely divided inorganic phosphates using an orthophosphate agglomerating aid. 3,620,972, Cl. 252-1.

Fitzgerald, Richard J.; Jacobsen, Ronald R.; and Rueger, William J., to International Business Machines Corporation. Tape reel cover assembly with three-position integral hinge mechanism. 3,620,478, Cl. 242-197.

Fix, Joseph O., to United States of America, Army. Method of retaining inner race of bearing for lubricated pin track. 3,620,578, Cl. 305-11.

Flaherty, Robert, to United States of America, Atomic Energy Commission. Method of operating a radioisotope radiation source. 3,620,917, Cl. 176-39.

Flanigan, Richard J.: *See—*
Leming, Paul W.; and Flanigan, Richard J.,3,619,952.

Fleisher, William M.,IV: *See—*
Conlon, Ralph D.; and Fleisher, William M.,IV,3,620,134.

Fleitman, Albert H.: *See—*
Herchenroeder, Robert B.; Chow, Joe G. Y.; and Fleitman, Albert H.,3,620,852.

Fletcher, Charles P.: *See—*
Friedlander, Erich S.; and Fletcher, Charles P.,3,621,376.

Fleury, Josef Viktor, to Mewecco Fleury Mechanische Werkstatte. Letter opener. 3,619,902, Cl. 30-294.

Flicker, Howard D., to API Corporation. Diffusion coating. ,362,080, Cl. 117-71.

Flinspach, Sebastian: *See—*
Reinhardt, Gerd; Heide, Horst; and Flinspach, Sebastian,3,620,511.

Floehr, Walter L., to Midland-Ross Corporation. Hopper gate power drive mechanism. 3,620,169, Cl. 105-282.

Floehr, Walter L., to Midland-Ross Corporation. Hopper sliding gate outlet assembly. 3,620,170, Cl. 105-282.

Flour Corporation, Ltd., The: *See—*
Tennyson, Robert N., 3,620,031.

Floyd, Donald E.: *See—*
Hobbs, James; Perkins, Earl Stuart; and Floyd, Donald E.,3,621,212.

Fluck, Josef, to Schild, A., S.A. Unidirectional rotary drive coupling device for a watch movement. 3,620,337, Cl. 192-46.

FMC Corporation: *See—*
Anderson, Gerald R., 3,620,274.
Corliss, Duncan Simmons; Keast, Russell Raymond; and Saxman, Richard Lewis, 3,620,979.
Iles, Kenneth E.; Jung, Harry J.; and Arell, Elmo R., 3,620,526.
So, Stephen W., 3,620,506.

Folkes, Hugh L., to Dunlop Holdings Limited. Conveyors. 3,620,357, Cl. 198-193.

Fonda-Bonardi, Giusto, assor. of 6.5% to Estes, Robert S., 8% to Steele, Emmett, 8% to Kurtz, Jay, 9% to Linahan, James, 2% to Clement, Carl, 6.5% to Merrill, Edward S., and 1% to Galvin, M. Royal. Power density control for fluid-dynamic engines. 3,620,017, Cl. 60-59.

Fonjallaz, Claude Roger, to Centre Electronique Horloger S.A. Bistable Multivibrator circuit. 3,621,303, Cl. 307-292.

Forbes, Frank, to Dravo Corporation. Traveling grate apparatus and method. 3,620,519, Cl. 263-28.

Ford, Andrew George; and Hudson, Ronald Augustus, to Imperial Chemical Industries Limited. Plastics containers and packages. 3,620,774, Cl. 99-171.

Ford Motor Company: *See—*
Hashmi, Zia, 3,621,327.
Lindberg, Victor L., 3,620,600.

Ford, Norman C., Jr. Scattered light measurement providing auto- correlation function. 3,621,220, Cl. 235-181.

Forest, Edward: *See—*
Keller, Carol K.; and Forest, Edward,3,620,950.

Foret, P. G., Inc.: *See—*
Foret, Pierre G., 3,620,230.

Foret, Pierre G., to Foret, P. G., Inc. Means and method of cleaning information-carrying tape. 3,620,230, Cl. 134-9.

Formica Corporation: *See—*
Kelly, Peter Bernard; and Grosheim, Gene Edward, 3,620,899.

Forster, Hans-Joachim M.; and Eltze, Ulrich, to Daimler-Benz Aktiengesellschaft. Control system of automatically shifting transmissions, especially for motor vehicles. 3,620,103, Cl. 74-860.

Fortmann, William E.: *See—*
Urban, Louis A.; and Fortmann, William E.,3,620,011.

Foss, Charles W.: *See—*
Hough, Harold L.; and Foss, Charles W.,3,621,232.

Fosse, Navarro T., to Hydrotile Machinery Company. Feed control for concrete pipe machine. 3,619,872, Cl. 25-36.

Foster, Harold Marvin, to Sherwin-Williams Company, The. 2,6 Bis(thiomethyl)4-methyl anisole. 3,621,065, Cl. 260-609.

Foster, Karl; and Seidel, Joseph, to Westinghouse Electric Corporation. Phosphate glass coating for electrical steel sheets. 3,620,779, Cl. 106-47.

Foster, Milton E.; and Gogin, Dimitri A., to McDonnell Douglas Corporation. Chain drive cargo handling system. 3,620,353, Cl. 198-160.

Foster, Robert G.: *See—*
Evans, James W.; and Foster, Robert G.,3,620,703.

Foster, Thomas W.: *See—*
Morse, Hugh B.; and Foster, Thomas W.,3,620,439.

Fox, Raymond J., to Robertshaw Controls Company. Fuel control system and parts therefor or the like. 3,620,659, Cl. 431-6.

Foxboro Company, The: *See—*
Bowditch, Hoel L., 3,620,135.

Fradenburgh, John: *See—*
Neal, Morris P.; Reichert, Donald G.; and Fradenburgh, John,3,620,138.

Frank, Alan I. W., Corporation, The: *See—*
Kulp, Robert C., 3,620,437.

Franked, John: *See—*
Dalmo, Bror; Franked, John; Landhult, Hans; Nordberg, Birger; Ronnevig, Carl; and Tjernstrom, Ove,3,621,315.

Frankische Isolierrohr-und Metallwaren-Werke Gebr.: *See—*
Zieg, Wilhelm; Schmidt, Georg; Hauck, Edgar; Massell, Ingo; and Gruebel, Gustav, 3,620,115.

Franklin, David Louis; and Balents, Leon Martin, to RCA Corporation. Mounting structure for high power semiconductor devices. 3,620,692, Cl. 29-195.

Franklin GNO Corporation: *See—*
Cohen, Martin J., 3,621,239.
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D., 3,621,240.

Freche, John C.; and Waters, William J., to United States of America, National Aeronautics and Space Administration. Nickel base alloy. 3,620,718, Cl. 75-170.

Freebairn, Hugh T.: *See—*
McDonnell, Gerald F.; and Freebairn, Hugh T.,3,620,765.

Freedman, Philip D.: *See—*
White, Chester N.; and Freedman, Philip D.,3,621,260.

Freeman Chemical Corporation: *See—*
Svoboda, Glenn R.; Singleton, Fred G.; and Eshleman, Lindley H., 3,621,093.

Freeman, Michael Harold, to Pilkington Perkin-Elmer Limited. Optical display systems. 3,620,592, Cl. 350-9.

Freeport Sulphur Company: *See—*
Olivier, James Peter; and Hickin, George Keller, 3,621,243.

Fremont, Robert D., to Colt's Inc. Magazine with anti-double-feed indentations in the side walls. 3,619,929, Cl. 42-50.

Fremont, Robert S., to Halo Lighting Division, a division of McGraw Edison Company. Mounting electrical sockets for a lighting fixture. 3,621,234, Cl. 240-52.4

Frers, Alberto German. Cages for housing and fattening poultry. 3,620,193, Cl. 119-18.

Frey, Egon, to Daimler-Benz Aktiengesellschaft. Parking light system for motor vehicles. 3,621,329, Cl. 315-77.

Friday, Robert E., to King Radio Corporation. Electronic track and store device. 3,621,224, Cl. 235-183.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Grotkasten, Klaus; and Hirschkorn, Ingo, 3,620,561.

Friedell, Morley V., to Martin Marietta Corporation. Non-chattering pressure relief valve. 3,620,501, Cl. 251-333.

Friedlander, Erich S.; and Fletcher, Charles P., to General Electric Company Limited, The. Polyphase network voltage stabilizing arrangement utilizing saturated reactors. 3,621,376, Cl. 323-50.

Friedman, Herman H.; Pitchon, Esra; Cascione, Alexander S.; and Banks, Burton L., to General Foods Corporation. Process for obtaining an aromatized coffee extract. 3,620,758, Cl. 99-71.

Friedman, Ira J. Sheathed comb. 3,620,229, Cl. 132-119.

Friedrich, Kurt; and Straimer, Georg, to International Standard Electric Corporation. Reflection type contactless touch switch having housing with light entrance and exit apertures opposite and facing. 3,621,268, Cl. 250-221.

Friedrich Uhde GmbH: *See—*
Driller, Josef, 3,619,909.

Friedrichs, Ruth, to Pyro-Werke GmbH. Weston standard cells having resiliently biassing plug means. 3,620,845, Cl. 136-88.

Fritsch, Werner: *See—*
Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Stache, Ulrich,3,621,015.
Stache, Ulrich; Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Schroder, Hans-Georg,3,621,014.

Frolovtsev, Vasily Alexandrovich: *See—*
Ivashkov, Ilya Ilich; and Frolovtsev, Vasily Alexandrovich,3,620,094.

Fromknecht, Charles T.: *See—*
Bolzan, James J., Jr.; and Fromknecht, Charles T.,3,619,851.

Fruchnight, Ocke C., to United States of America, Army. Coating for magnesium and its alloys and method of applying. 3,620,939, Cl. 204-56.

Fruehauf Corporation: *See—*
Fujioka, Richard T., 3,620,391.

Fruehauf, Waldo G., to General Signal Corporation. Hydraulic power circuit with emergency lowering provisions. 3,620,129, Cl. 91-449.

Fruhstorfer, Wolfgang; Namenyi, Istvan; Baumer, Wilhelm; and Dennler, Bernd, to Merck, E., A.G. Tetraoxaspiro(5,5)undecanes and process for the preparation thereof. 3,621,034, Cl. 260-340.7

Fryberger, David: *See—*
Epstein, Max; Fryberger, David; Serafin, Robert J.; and Van Den Heuvel, Anthony P.,3,621,328.

Fryer, Thomas B., to United States of America, National Aeronautics and Space Administration. RF controlled solid state switch. 3,621,290, Cl. 307-247.

Fugiwara, Hirotomo; Arai, Takuya; and Miyamoto, Noboru, to Fuji Photo Film Co., Ltd. Casing for a tape cartridge. 3,620,361, Cl. 206-1.

Fuhrimann, Paul, to Hydrel AG. Maschinenfabrik. Hydraulic reversing system for a reciprocating working member. 3,620,126, Cl. 91-280.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
Nagae, Masaomi; and Yokokawa, Sumio, 3,621,369.

Fuji Photo Film Co., Ltd.: *See—*
Fugiwara, Hirotomo; Arai, Takuya; and Miyamoto, Noboru, 3,620,361.
Watanabe, Hiromitsu, 3,620,613.

Fuji Shashin Film Kabushiki Kaisha: *See—*
Honjo, Satoru; Tamai, Yasuo; Sato, Masamichi; and Matsumoto, Seiji, 3,620,798.

Fujimoto, Shigenobu: *See—*
Ueda, Shizuma; and Fujimoto, Shigenobu,3,620,464.

Fujimoto, Ted Y., to North American Rockwell Corporation. Nodable field effect transistor driver and receiver circuit. 3,621,291, Cl. 307-251.

Fujioka, Richard T., to Fruehauf Corporation. Railcar unloading system. 3,620,391, Cl. 214-38.

Fujishima, Tohru: *See—*
Hirota, Ryoichi; Fujishima, Tohru; Miyazaki, Gentaro; Iwasaki, Tadahiko; Akatsu, Mitsuharu; and Kinoshita, Tomoo,3,621,123.

Fujishima, Toshiyuki: *See—*
Sekino, Shozo; Fujishima, Toshiyuki; and Yada, Hiroshi,3,620,717.

Fulford, Richard S., to Cities Service Oil Company. Stimulation and selective plugging of petroleum reservoirs. 3,620,305, Cl. 166-282.

Furst, Stefan, to Reiners, Walter. Waft supplying device for a warp knitting machine. 3,620,048, Cl. 66-84.

Furukawa Electric Company Limited, The: *See—*
Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakajima, Jun, 3,621,190.

Furukawa, Yoshiki: *See—*
Iikubo, Yuichi; Nishida, Takuji; and Furukawa, Yoshiki,3,620,030.

Furuya, Akira: *See—*
Abe, Shigeo; and Furuya, Akira,3,620,922.
Abe, Shigeo; Furuya, Akira; and Okachi, Ryo,3,620,921.

Gabriel, Robert P. Method for treating harvested non-chlorophylleous produce. 3,620,773, Cl. 99-154.

GAF Corporation: *See—*
Cerwonka, Edward J., 3,620,734.

Gaffal, Karl; and Sturm, Hans-Dieter, to Klein Schanzlin & Becker Aktiengesellschaft. Pump with hydrostatic bearing. 3,620,639, Cl. 415-111.

Gagneux, Andre R., to Geigy Chemical Corporation. Substituted urea derivatives. 3,621,040, Cl. 260-345.1

Gagneux, Andre R., to Geigy Chemical Corporation. Composition and method for producing a tuberculostatic effect. 3,621,100, Cl. 424-322.

Gagnon, Robert. Tiltable trailer. 3,620,397, Cl. 214-506.

Gall, Rudi: *See—*
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Voemel, Wolfgang; and Sauer, Winfriede,3,621,022.

Galmiche, Philippe; Hivert, Andre R.; and Marty, Michel E., to Office National d'Etudes et de Recherches Aerospatiales (par abreviation: O.N.E.R.A.). Process for producing metallic materials containing thoria. 3,620,720, Cl. 75-206.

Galvin, M. Royal: *See—*
Fonda-Bonardi, Giusto, 3,620,017.

Gancberg, Abraam; Carpenter, Raymond; and Paquet, Rene. Shaped article with insecticidal properties. 3,620,453, Cl. 239-60.

Ganiaris, Neophytos, to Struthers Patent Corporation, mesne. Multistage freeze concentration of coffee. 3,620,034, Cl. 62-58.

Ganter, Wolfgang; and Otto, Heinz, to Messrs. Gebruder Junghans Gesellschaft mit Beschraenkter Haftung. Ratchet wheel device for a balance wheel clock. 3,620,005, Cl. 58-28.

Gantschnigg, Gottfried K., to ARINC Research Corporation. Spline-type pivots, universal joints and flexible couplings. 3,620,043, Cl. 64-9.

Garber, A. L., Company: *See—*
Wood, Robert; and Rouse, Paul B., 3,620,438.
Gardner, John D. L. Hot food dispensing machine. 3,620,341, Cl. 194-10.
Gardner, William Allen, to Bell Telephone Laboratories, Incorporated. Sampled data filter. 3,621,402, Cl. 328-37.
Gargrave, Robert J., to Dayton Progress Corporation. Ejector type punch. 3,620,113, Cl. 83-98.
Garrett Corporation, The: *See—*
Beck, William H.; and Trimble, Daniel W., 3,621,365.
Gates, Ronald G.: *See—*
Noddings, Charles R.; Dietzler, Andrew J.; and Gates, Ronald G.,3,621,071.
Gates, Terry Lee, to Pharr Yarns, Incorporated. Method of processing thermoplastic yarn. 3,619,875, Cl. 28-72.
Gauger, Roy C., to Bendix Corporation, The. Mechanism for thin film deposition. 3,620,956, Cl. 204-298.
Gaut, Charles John: *See—*
Finn, Frederick George; and Gaut, Charles John,3,619,829.
Gayda, Michael L. Carburetor air filter unit. 3,619,990, Cl. 55-482.
Gaylord, Eber W.; and Mori, Ernest A., to Gulf Research & Development Company. Apparatus for controlling solids-laden liquids. 3,620,653, Cl. 417-568.
Gebr. Hilgeland: *See—*
Nebendorf, Heinrich, 3,619,835.
Gebruder Eberhardt: *See—*
Eggenmuller, Alfred; Scherer, Lorenz; Bellan, Heinrich; and Wohrle, Rudolf, 3,619,995.
Gebruder Einfalt Blechspielwarenfabrik: *See—*
Einfalt, Alfred,, 3,620,534.
Gebruder Heller Maschinenfabrik GmbH: *See—*
Durr, Alfred W.; Gunsser, Otto; and Heller, Hubert H., 3,620,109.
Geckle, Raymond James; and Wilt, Larry John, to AMP Incorporated. Lubrication of contact surfaces. 3,620,839, Cl. 117-226.
Gehring, Christoph W. Hydraulic feeding device for a honing tool. 3,619,956, Cl. 51-349.
Geiger, Lewis J., Jr., to Air Reduction Company, Incorporated. Fuel-air fired furnace with supplemental oxygen-fuel burner. 3,620,514, Cl. 263-40.
Geigy Chemical Corporation: *See—*
Gagneux, Andre R., 3,621,040.
Gagneux, Andre R., 3,621,100.
Watthey, Jeffrey W. H.; and Doebel, Karl J., 3,621,098.
Gelezunas, Vincent L.: *See—*
Johnston, Phillip A.; and Gelezunas, Vincent L.,3,621,257.
Gelhard, Egon. Dirigible. 3,620,485, Cl. 244-29.
Gellert, Dale A., to Procter & Gamble Company, The. Disposable diaper having pressure sensitive tape fastener and built-in disposal fastener. 3,620,217, Cl. 128-284.
Gemert, Rudolf, to GSW Limited-GSW Limitee. Automatic drying cycle for clothes dryers. 3,621,202, Cl. 219-492.
General Cable Corporation: *See—*
Bravin, Ben, 3,620,482.
Kursinczky, William, 3,620,063.
Kursinczky, William, 3,620,348.
McGrath, Martin H., 3,621,110.
General Datacom Industries: *See—*
Davis, Steven J., 3,621,470.
General Electric Company: *See—*
Bauer, Douglas M., 3,621,469.
Berger, Abe; and Selin, Terry G., 3,621,046.
Butterfield, John L, 3,620,045.
Celentano, Vincent D., 3,620,817.
Danko, George K., 3,621,111.
Davis, Richard K., 3,620,010.
Dinger, Edward H., 3,621,352.
Dinger, Edward H., 3,621,355.
Fawcett, James W.; Irwin, John M.; and McFadyen, Robert J., 3,621,354.
Hansen, Wilbur O., 3,619,877.
Heft, Eldon B.; and Humpage, Harold A., 3,621,169.
Heidtmann, Donald S., 3,621,293.
Hertz, Jerome J.; and Salvadore, William E., 3,621,091.
Holcomb, Robert A., 3,621,174.
Jacobson, Chester F.; and Kexel, Edward P., 3,619,996.
Kettler, Clarence J., 3,621,374.
Kettler, Clarence J., 3,621,375.
Miller, David E., 3,621,391.
Morelock, Charles R., 3,620,836.
Nakata, Roy, 3,621,109.
Ringwall, Carl G.; and Bottone, Salvatore, Jr., 3,621,453.
Schlaudroff, Leo M., 3,620,885.
Selin, Terry G., 3,621,060.
Sims, Marion W.; and Avila, Francisco C., 3,620,886.
Stickley, Beryl C.; and Tutle, Edward G., 3,621,112.
Stone, Aidan M., 3,621,165.
Tong, Duncan, 3,619,938.
Vandervort, Thomas L., 3,621,370.
Wenzel, James L.; and Clark, Lawrence Arthur, 3,620,046.
Wright, John H.; and Hajjar, Abraham L., 3,620,976.
General Electric Company Limited, The: *See—*
Friedlander, Erich S.; and Fletcher, Charles P., 3,621,376.
General Foods Corporation: *See—*
Friedman, Herman H.; Pitchon, Esra; Cascione, Alexander S.; and Banks, Burton L., 3,620,758.
General Instrument Corporation: *See—*
Newberry, Meigs W., 3,621,439.
Smith, Kent F.; and Smith, Kay D., 3,621,387.
General Motors Corporation: *See—*
Beck, Roger W., 3,620,829.
Burke, Harold J., 3,621,167.
Chana, Howard E., 3,620,100.
Peters, Theodore F., 3,620,560.
Stevenson, Paul D.; and Tucholski, Leon A., 3,620,646.
General Signal Corporation: *See—*
Cary, Francis H., 3,620,248.
Cary, Francis H., 3,620,649.
Fruehauf, Waldo G., 3,620,129.
General Tire & Rubber Company, The: *See—*
Hartz, Walter A.; Meyer, Daniel A.; and Sommer, John G., Jr., 3,620,901.
Williger, Ervin J., 3,620,900.
Genneken, George Thomas: *See—*
Antas, Stanley Casimir; Genneken, George Thomas; and Smith, Donald Tolman,3,621,117.
Gentex Corporation: *See—*
Aileo, Jackson Anthony, 3,619,814.
Geo Space Corporation: *See—*
Badger, Algernon S.; and Moffitt, Jerrell F., 3,621,410.
Keeling, Richard W.; Gilbreath, Cecil R.; and Stamps, Virgil O., 3,621,412.
Geominy, Louis Joseph Henri; Gommans, Hubertus Johannes Josephus; Mans, Leonardus Frans Helene; and Ruytenbeek, Silvester Marie, to U.S. Philips Corporation. Electric resistance heating cable. 3,621,203, Cl. 219-528.
Georgia Kaolin Company: *See—*
Solomon, David H., 3,620,789.
Georgoudis, Paul C.: *See—*
Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Field, Stanely,3,620,729.
Gerich, Anton J., to Therm-O-Disc, Incorporated. Manual reset thermostat. 3,621,434, Cl. 337-348.
Germino, Felix J.; Kite, Francis E.; and Christensen, Edwin H., to CPC International Inc. Texturizing starch. 3,620,842, Cl. 127-32.
Gerst, Carl W.: *See—*
Paciorek, Leonard J.; and Gerst, Carl W.,3,621,400.
Gesellschaft fur Kernenergieverwertung in Schiffbau: *See—*
Drittler, Karl; and Luhleich, Hartmut, 3,620,835.
Gevaert-Agfa N.V.: *See—*
Poot, Albert Lucien, 3,620,740.
Poot, Albert Lucien; and Van Brandt, Rene Alois, 3,620,741.
Tavernier, Bernard Hippoliet; de Jaeger, Nikolaas Cyriel; and Vanheertum, Johannes Josephus, 3,620,721.
Willems, Jozef Frans; Noe, Robert Joseph; Vanheertum, Johannes Josephus; and Van Paesschen, August Jean, 3,620,742.
Gibson, Earl D., to North American Rockwell Corporation. Data receiver with intersymbol interference correction. 3,621,139, Cl. 178-69.
Giddings & Lewis, Inc.: *See—*
Maastricht, Charles R., 3,620,586.
Gilbert, Dixie E., to Phillips Petroleum Company. Sealing open end parisons. 3,619,857, Cl. 18-5.
Gilbreath, Cecil R.: *See—*
Keeling, Richard W.; Gilbreath, Cecil R.; and Stamps, Virgil O.,3,621,412.
Gilchrist, Albert D.; and Woo, Chung H., to Victoreen Leece Neville, Inc. Control for de-energizing an alternator when exposed to water. 3,621,333, Cl. 317-13.
Gilgore, William H.; and Shirey, Carey L., to Teledyne, Inc. Rack type dough proofer. 3,620,352, Cl. 198-138.
Gillette Company, The: *See—*
Webster, Milo E., 3,620,422.
Gilson, Robert E.: *See—*
Gilson, Warren E.; and Gilson, Robert E.,3,621,263.
Gilson, Warren E.; and Gilson, Robert E. Volumetric fraction supply apparatus. 3,621,263, Cl. 250-218.
Giltner, Benedict Clare: *See—*
Schroeder, Duane Arthur; Weiss, Alvin Dennis; and Giltner, Benedict Clare,3,620,840.
Gingher, Carl E. Garment hanger bar. 3,620,376, Cl. 211-123.
Giorgi, Tiziano A.: *See—*
Porta, Paolo della; Giorgi, Tiziano A.; Kindl, Bruno Milan; and Zucchinelli, Mario,3,620,645.
Girling Limited: *See—*
Weatherhogg, Charles Brian, 3,620,136.
GKN Birfield Transmissions Limited: *See—*
Abbott, Randle L.; and Green, Paul C., 3,620,101.
Glanzstoff AG: *See—*
Siggel, Erhard; Rein, Walter; and Caesar, Horst-Manfred, 3,621,074.
Glascow, Paul J., to Glasgow Products, Inc. Fluidic washing machine. 3,620,050, Cl. 68-355.
Glasgow, Paul J., to Glasgow Products, Inc. Clamping tape. 3,620,896, Cl. 161-123.
Glasgow Products, Inc.: *See—*
Glascow, Paul J., 3,620,050.
Glasgow, Paul J., 3,620,896.
Glasrock Products, Inc.: *See—*
Wenzlaff, Karl, 3,620,329.

Gleason, C Roy, to Waste Paper Reclamation Corporation. Method for reclaiming pulp from waste papers. 3,620,909, Cl. 162-8.

Gleim, Paul S.; and Bean, Kenneth E., to Texas Instruments, Incorporated. Integrated circuit fabrication. 3,620,833, Cl. 117-212.

Godard, Pierre Louis Simon, to Chrysler France. Drilling device having yieldable means for limiting the thrust pressure to a predetermined amount. 3,620,636, Cl. 408-141.

Gogin, Dimitri A.: *See—*
Foster, Milton E.; and Gogin, Dimitri A.,3,620,353.

Golden Wonder Limited: *See—*
Dalgleish, James, 3,620,423.

Goldsberry, Eugene J., to Dayco Corporation. Apparatus for and method of packaging endless belts. 3,619,966, Cl. 53-3.

Goldstein, Arthur. Body drying apparatus. 3,621,199, Cl. 219-370.

Goldstein, Paul, deceased0 (by Kirschner, Phyllis Goldstein; executrix), to Rolla-Mount Joint Venture, The. Dry mount apparatus. 3,621,195, Cl. 219-243.

Golitz, Hans Dietrich; Simmler, Walter; and Schwabe, Peter, to Farbenfabriken Bayer Aktiengesellschaft. Bis-and tris-trialkoxysilylalkylamines. 3,621,047, Cl. 260-488.8

Goltermann, Wandel U.: *See—*
Dick, Rudolf, 3,621,471.

Golumbic, Harvey J.,: *See—*
Golumbic, Harvey J., 3,620,865.

Golumbic, Harvey J., 45% to Golumbic, Harvey J., 45% to Bregoff, Robert M. 10% to Calabro, Alfred A. Method for repairing flexible materials. 3,620,865, Cl. 156-98.

Gomlak, Norman H.: *See—*
Weil, Edward D.; and Gomlak, Norman H.,3,620,994.

Gommans, Hubertus Johannes Josephus: *See—*
Geominy, Louis Joseph Henri; Gommans, Hubertus Johannes Josephus; Mans, Leonardus Frans Helene; and Ruytenbeek, Silvester Marie,3,621,203.

Gonski, Joseph, to Westinghouse Air Brake Company. Loading device. 3,620,345, Cl. 198-8.

Good, Thomas W.; and Zbikowski, Theodore H., to Tonka Corporation. Articulated toy vehicle. 3,619,940, Cl. 46-201.

Goodbody, James, to Lesney Products & Co., Limited. Toy vehicle wheel and axle mounting. 3,619,943, Cl. 46-221.

Goodell, Albert; and Greene, William L. Extrication back splint. 3,620,211, Cl. 128-89.

Goodrich, B. F., Company, The: *See—*
Bartley, Donald R., 3,620,867.
Cohen, Louis, 3,620,988.
Donat, Frank J., 3,621,077.
Morrissey, Richard T.; and Hess, Nelson C., 3,620,811.

Goodwin, Norton. Microphotographic record and method. 3,620,622, Cl. 355-43.

Goodyear Aerospace Corporation: *See—*
Blair, Lloyd R.; and Martin, Gregory L., 3,621,450.
Charpentier, Jean F.; and Ross, Robert S., 3,620,486.

Gordy, Travis L., to Continental Oil Company. Substrates having strippable protective coatings. 3,620,796, Cl. 117-6.

Gorike, Rudolf; and Kollesberger, Wilhelm, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Magnet system for an electrodynamic transducer. 3,621,420, Cl. 335-231.

Gossel, Hartmut; Merkle, Kurt; and Memmel, Ferdinand, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Pigment preparations to be used in non-aqueous systems. 3,620,793, Cl. 106-308.

Gostomski, Frank T. Track tightener and rear idler suspension system. 3,620,318, Cl. 180-5.

Goto, Tatsuo; Matsudo, Yoryo; and Watanabe, Hiroshi, to Hitachi, Ltd. Controlled induction motor device. 3,621,351, Cl. 318-227.

Gould, Floyd T., to Honeywell Inc. Electrographic recording medium. 3,620,831, Cl. 117-201.

Gould, James L. Marking hammer. 3,620,159, Cl. 101-28.

Grace, W. R., & Co.: *See—*
Guthrie, James L., 3,620,878.
Holcombe, Edward L., 3,619,969.
Sterrett, Robert W.; Jacob, Francis J.; and Chemberlain, Merle D., 3,619,961.

Graf, Russell H. Fishing game. 3,620,532, Cl. 273-1.

Graham, George C., 50% to Kunik, Jordan, I. Coin card loading machine. 3,619,978, Cl. 53-160.

Graham, Robert, to Newalls Insulation & Chemical Company Limited. Insulation. 3,620,258, Cl. 138-178.

Grakauskas, Vytautas, to Aerojet-General Corporation. Fluoroammonium salts, their preparation, and uses. 3,620,688, Cl. 23-356.

Grandi Padiglioni, S.p.A.: *See—*
Viesi, Aldo, 3,619,958.

Grant, Norman H.: *See—*
Russell, Peter B.; Alburn, Harvey E.; and Grant, Norman H.,3,621,011.

Grasso, Joseph C., to Accessory Specialties, Inc. Fastener assembly for mounting of wall-recessed cabinets and similar fixtures. 3,620,404, Cl. 220-18.

Gray, Foster Lee, to Texas Instrument, Incorporated. Method and apparatus for forming and drawing fused metal oxide tubes. 3,620,704, Cl. 65-86.

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Great Canadian Oil Sands Limited: *See—*
White, Chester N.; and Freedman, Philip D., 3,621,260.

Green, Milton. Pinch effect laser. 3,621,455, Cl. 331-94.5

Green, Paul C.: *See—*
Abbott, Randle L.; and Green, Paul C.,3,620,101.

Greene, William L.: *See—*
Goodell, Albert; and Greene, William L.,3,620,211.

Greenewald, Herbert, Jr., to North American Rockwell Corporation. Aluminum casting alloy. 3,620,854, Cl. 148-32.

Greenwood, Fred, to Hudson, Robert, Limited, mesne. Mine cars. 3,620,392, Cl. 214-63.

Gregoire, Resta S., to Z-Loc Block Co., Inc. Toy blocks. 3,619,935, Cl. 46-19.

Griese, Elmer W., Jr., to National Can Corporation. Plastic bail for container and method of attaching bail. 3,620,410, Cl. 220-94.

Griest, Raymond H., to United States of America, Air Force. Vacuum compensated mirror mount assembly. 3,620,607, Cl. 350-310.

Griffin, Gordon R.: *See—*
White, George R.; and Griffin, Gordon R.,3,620,603.

Griffin, Joseph R.: *See—*
Lineberger, Robert O.; Wiberley, James S.; and Griffin, Joseph R.,3,620,803.

Griffiths, John Michael, to Post Office, The. Apparatus for aligning word interval signals with the word frame of received digital data. 3,621,140, Cl. 178-69.5

Grigsby, Gilbert R., to Lubrastart International. Metered fluid dispensing apparatus. 3,620,424, Cl. 222-450.

Grishin, Peter F., to Roberts Company. Open end spinning assembly and method. 3,620,002, Cl. 57-58.89

Grosheim, Gene Edward: *See—*
Kelly, Peter Bernard; and Grosheim, Gene Edward,3,620,899.

Grosse-Benne, Willi: *See—*
Beermann, Paul; and Grosse-Benne, Willi,3,619,930.

Grossman, James D., to International Flavors & Fragrances, Inc. Perfume composition containing dihydroisocaryophy- oxide. 3,620,982, Cl. 252-522.

Grosvenor, Herbert D.; and Walker, Jerome F., to Grunswick Corporation. Incremental pinfall system. 3,620,533, Cl. 273-54.

Grotkasten, Klaus; and Hirschkorn, Ingo, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Transporting device for use in connection with the manufacture of unvulcanized belted tires. 3,620,561, Cl. 294-67.

GRT Corporation: *See—*
Wood, James B., 3,621,151.

Gruber, Hermann: *See—*
Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberhart; and Zecher, Wilfried,3,621,000.

Gruebel, Gustav: *See—*
Zieg, Wilhelm; Schmidt, Georg; Hauck, Edgar; Massell, Ingo; and Gruebel, Gustav,3,620,115.

Grunswick Corporation: *See—*
Grosvenor, Herbert D.; and Walker, Jerome F., 3,620,533.

Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S., to Mac Dermid Incorporated. Forming plastic parts having surfaces receptive to adherent coatings. 3,620,933, Cl. 204-15.

Gruska, Ralph, to Ejectoret S.A. Lipstick and similar holder. 3,620,632, Cl. 401-78.

GSW Limited-GSW Limitee: *See—*
Gemert, Rudolf, 3,621,202.

GTE Electric Incorporated: *See—*
Sama, Lawrence; and Pepino, George T., Jr., 3,620,693.

GTE Sylvania Incorporated: *See—*
Eckenbrecht, Robert Roy; and Scott, Benton Boyd, 3,621,121.

Gualandi, Dante; and Jehenson, Pierre, to European Atomic Energy Community (Euratom). Process for the production of a composite material Al-Mg-Al_2O_3-MgO. 3,619,894, Cl. 29-420.5

Gudaz, John A.: *See—*
Keyes, Marion A., IV; Gudaz, John A.; and Tsing, Yuan-Hao,3,620,915.

Guenther, Robert P., to Bell Telephone Laboratories, Incorporated. Waveguide support system. 3,621,485, Cl. 333-95.

Guglielmo, Richard J., Sr.; and Chookazian, Nishan G., to EMA Corporation. Electromagnetic adhesive and method of joining materials thereby. 3,620,875, Cl. 156-272.

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Guigan, Jean; and Laucournet, Robert. Installation for multiple and automatic analyses. 3,620,678, Cl. 23-253.

Gulde, Charles James, to Crowe-Gulde Cement Company. Method for making facing brick with varied color and texture. 3,621,086, Cl. 264-71.

Gulf Oil Corporation: *See—*
Plumbar, Oliver, 3,620,971.

Gulf Research & Development Company: *See—*
Carr, Norman L.; Somers, Allen E.; and Stahlfeld, Donald L., 3,621,217.
Deffner, John F., 3,621,044.
Gaylord, Eber W.; and Mori, Ernest A., 3,620,653.
Hazen, Stanley M.; and Heilman, William J., 3,620,990.

Leathen, William W., 3,620,927.
Gulick, Graham L., to Quvoe Chemical Industries. Re-refining of waste crankcase and like oils. 3,620,967, Cl. 208-179.
Gunshinan, Bernard F.; and Hand, Frederick W., Jr., to Bendix Corporation, The. Direct current short circuit device. 3,621,486, Cl. 333-97.
Gunsser, Otto: *See—*
Durr, Alfred W.; Gunsser, Otto; and Heller, Hubert H.,3,620,109.
Gunto, Robert L.; and Mathisen, Henry A., to Addressograph-Multigraph Corporation. Photoelectrostatic copying machine with corona means establishing a reference potential. 3,620,614, Cl. 355-3.
Guthrie, James L., to Grace, W. R., & Co. Bonding with ethylene copolymer adhesive and adhesion promoting agent. 3,620,878, Cl. 156-309.
Gutsche, Klaus; and Schroder, Eberhard, to Schering AG. Blood sugar lowering sulfonylamino pyrimidines. 3,621,026, Cl. 260-256.5
Haas, Charles H., to United States of America, Navy, mesne. Sawtooth generator with a ramp-bias voltage comparator. 3,621,282, Cl. 307-228.
Habbal, Nazem A.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,621,130.
Haberecht, Rolf R.: *See—*
Sivertsen, David R.; Cecil, Olin B.; and Haberecht, Rolf R.,3,620,945.
Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Stache, Ulrich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of (androst-17 - yl) -α-pyrones. 3,621,015, Cl. 260-239.57
Haede, Werner: *See—*
Stache, Ulrich; Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Schroder, Hans-Georg,3,621,014.
Hagen, Thomas E., to Ferroxcube Corporation of America. Linear rise and fall time current generator. 3,621,281, Cl. 307-228.
Hagopian, Erivan, to Cabot Corporation. Process for treating carbon black. 3,620,792, Cl. 106-307.
Hahn, Erwin; and Wippel, Hans Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Water-insoluble thiadiazole containing monoazo dyes. 3,621,007, Cl. 260-158.
Haist, Grant M.; Humphlett, Wilbert J.; and King, James R., to Eastman Kodak Company. Photo-sensitive compositions comprising silver complexes of 3-substituted-4-thiazoline-2-thiones and photosensitive elements comprising such compositions. 3,620,749, Cl. 96-94.
Hajjar, Abraham L.: *See—*
Wright, John H.; and Hajjar, Abraham L.,3,620,976.
Hakansson, Christer Lennart: *See—*
Soderberg, John Lennart; Back, Jarl Sigurd; and Hakansson, Christer Lennart,3,620,857.
Halaby, Josef E., to Alarm Products International, Inc. Magnetically responsive switching apparatus. 3,621,417, Cl. 335-205.
Halbert, William G., Jr., to Tenneco Oil Company. Tar recovery method. 3,620,303, Cl. 166-272.
Hall, James R., to Oldberg Manufacturing Company. Muffler construction and method of selectively modifying its sound attenuating characteristics. 3,620,330, Cl. 181-65.
Halliday, Geoffrey W.: *See—*
Jagger, Ernest T.; Halliday, Geoffrey W.; and Harrison, Frank,3,620,540.
Halliwell, David George; Outram, Michael Vaughan; and Bryan-Brown, Martin Hume, to Rolls-Royce Limited. Gas turbine engine. 3,620,020, Cl. 60-226.
Halloran, John J., Jr., to Combustion Engineering Inc. Centrifuge slurry supply. 3,620,442, Cl. 233-7.
Halo Lighting Division: *See—*
Fremont, Robert S., 3,621,234.
Hamaoka, Kenji: *See—*
Okabe, Masanaga; Yoshihara, Toshio; and Hamaoka, Kenji,3,620,777.
Hamersma, Joseph Warren, to Atlantic Richfield Company. Vinyl fluoride from 1-fluoro-2-chloroethane by pyrolysis in the presence of bromine. 3,621,067, Cl. 260-653.5
Hamilton Watch Company: *See—*
Henderson, John E., 3,620,165.
Walton, Richard S., 3,621,313.
Hammann, Ingeborg: *See—*
Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm,3,621,082.
Hammer, Jacob Meyer; and Vural, Bayram, to RCA Corporation. Amplifiers and oscillators comprised of bulk semi- conductor negative resistance loaded slow-wave structure. 3,621,462, Cl. 331-96.
Hand, Frederick W., Jr.: *See—*
Gunshinan, Bernard F.; and Hand, Frederick W., Jr.,3,621,486.
Haney, Stanley C.; and Cimbalo, Robert N., to Atlantic Richfield Company. High space velocity hydrogenation of olefins. 3,620,966, Cl. 208-143.
Hankes, Robert W., to Somat Corporation. Waste pulping machine with shear and interrupter members. 3,620,460, Cl. 241-46.11
Hanline, John V.; and Chapin, Daniel M., to Film Equipment Manufacturing Co. Electrical apparatus for obtaining printing light intensity values. 3,621,225, Cl. 235-193.
Hannes, George John, to Johns-Manville Fiber Glass Inc., mesne % Prentice Hall Corporation System, Inc. Glass fiber laminates and method. 3,620,906, Cl. 161-203.
Hans, Richard G., to Pillsbury Company, The. Refrigerated batter products and method for preparing same. 3,620,763, Cl. 99-92.
Hansen, Henry J., Jr.: *See—*
Bills, Max E.; and Hansen, Henry J., Jr.,3,619,881.
Hansen, Theodore E.: *See—*
Bunish, Steve; Wilson, Floyd A.; and Hansen, Theodore E.,3,621,118.
Hansen, Villy H.: *See—*
Petersen, Povl V.; Hansen, Villy H.; and Hjortkjaer, Jes,3,621,101.
Hansen, Wilbur O., to General Electric Company. Capacitor assembly. 3,619,877, Cl. 29-25.41
Hanson, Alden B.: *See—*
Hanson, Chris A.; and Hanson, Alden B.,3,619,914.
Hanson, Chris A.; and Hanson, Alden B., to Lange Company, The. Boot tensioning device. 3,619,914, Cl. 36-2.5
Hanssmann, Nils: *See—*
McPherson, Neil Freeman; and Hanssmann, Nils,3,621,177.
Harbordt, Charles M., to Texaco Inc. Drilling fluid. 3,620,973, Cl. 252-8.5
Hardman, Roland, to National Research Development Corporation. Extraction of steroidal materials from vegetable materials. 3,620,919, Cl. 195-7.
Hargis, George R., III: *See—*
Partridge, Melvin H.; and Hargis, George R., III,3,619,845.
Harkness, Joseph R., to Briggs & Stratton Corporation. Automatic compression relief mechanism. 3,620,203, Cl. 123-182.
Harmon, James V.: *See—*
Stopka, Benjamin F.; Day, Dennis J.; Harmon, James V.; and Holt, Robert G.,3,620,631.
Harnisch, Heinz: *See—*
Cremer, Joseph; Harnisch, Heinz; Schulte, Friedrich; and Hinz, Arnulf,3,620,753.
Harris, Gleon B. Method of repairing cracked metallic castings. 3,619,893, Cl. 29-402.
Harris Intertype Corporation: *See—*
Kulwicki, Henry E., 3,620,139.
Harris, Roland G.; and Ryan, Joseph Henry, Jr., to Du Pont de Nemours, E. I., and Company. Heat shrinkable cushioning material. 3,620,898, Cl. 161-160.
Harris, William B., Jr. (III); Harris, William B.; and Davison, Richard R., to United States of America, Interior. Fluid heating by radiation. 3,620,206, Cl. 126-271.
Harris, William B.: *See—*
Harris, William B., Jr. (III); Harris, William B.; and Davison, Richard R.,3,620,206.
Harris, William M.; and Reese, Julian, to Spotting Equipment Co., Inc. Combined spotting board and spotting gun incorporation novel spotting method. 3,619,830, Cl. 8-149.1
Harrison, Frank: *See—*
Jagger, Ernest T.; Halliday, Geoffrey W.; and Harrison, Frank,3,620,540.
Harrison, John William. Pipe clamp. 3,619,891, Cl. 29-272.
Hartz, Walter A.; Meyer, Daniel A.; and Sommer, John G., Jr., to General Tire & Rubber Company, The. Elastomeric laminate composition. 3,620,901, Cl. 161-162.
Harvey, Muerner S.; and Viebrock, Frederick W., to Baxter Laboratories, Inc. Production of acid-active lactase. 3,620,924, Cl. 195-66.
Harvey, Robert J., to Meditron, Inc. Coated straw for modifying sour taste. 3,620,770, Cl. 99-138.
Hasegawa, Katsue: *See—*
Yoshimura, Susumu; Hasegawa, Katsue; Yamamoto, Yoshio; and Tajima, Iwao,3,621,342.
Hasegawa, Kazuaki; Nozaki, Kanzo Kawaguchi; and Yokoyama, Katsuyoshi, to Japan Bicycle Promotion Institute. Simultaneous fastening apparatus for wire spoke wheels. 3,620,281, Cl. 157-1.55
Hashirizaki, Shinya: *See—*
Akuta, Tomohiko; Honsyo, Yoshio; and Hashirizaki, Shinya,3,621,266.
Hashizume, Kunio: *See—*
Miyamoto, Ryou; Hashizume, Kunio; and Kitamura, Hiroshi,3,620,662.
Hashmi, Zia, to Ford Motor Company. Method of controlling the intensity of an electron beam. 3,621,327, Cl. 315-31.
Haskett, Barry F.: *See—*
Day, George G.; and Bonilla, Charles F., 3,620,942.
Hastwell, Peter J.; and Metcalfe, Kenneth A., to Commonwealth of Australia, The. Sensitised developers for electrophotography and electroradiography. 3,620,722, Cl. 96-1.2
Hatachi, Ltd.: *See—*
Minami, Shigeo, 3,621,222.
Hataya, Humio: *See—*
Takeuchi, Hisasuke; Sasaki, Ryoichi; Hataya, Humio; Hiraga, Ryo; Ishibashi, Eiichi; and Koyama, Takao,3,621,310.
Hatch, Melvin J., to Dow Chemical Company, The. Starch and cellulosic products treated with water- soluble sulfonium derivatives of diphenyl ether. 3,620,786, Cl. 106-213.
Hatch, Raymond R. Golf tool and carrier therefor. 3,620,426, Cl. 224-5.00c
Hatcher, Charles S.; and Teague, Charles H., to Phillips Petroleum Company. High production of water quenched filaments. 3,621,088, Cl. 264-178.

Hato, Shozo: *See—*
Sugiyama, Masao; Suzuki, Toshio; Noda, Hajime; Kashimura, Saburo; Hato, Shozo; and Tanaka, Hideo,3,621,119.

Hattori, Hiroshi: *See—*
Ono, Nobujiro; Hattori, Hiroshi; Tada, Shoji; and Kaida, Tsunetoshi,3,621,009.

Hattori, Satohiko: *See—*
Moroe, Tatsuo; Hattori, Satohiko; Komatsu, Akira; and Yamaguchi, Yuzo,3,620,918.

Hauck, Edgar: *See—*
Zieg, Wilhelm; Schmidt, Georg; Hauck, Edgar; Massell, Ingo; and Gruebel, Gustav,3,620,115.

Haverbeck, Gunther: *See—*
Van Winsen, Friedrich H.; Trachte, Kurt; and Haverbeck, Gunther,3,620,548.

Hawkinson, John: *See—*
Crane, Walton B.; and Hawkinson, John,3,620,175.

Hawley, George F., to Ivanhoe Research Corporation, mesne. Production system for treating fabric workpieces in sequence at a plurality of work stations. 3,620,525, Cl. 270-61.

Hay, Leon: *See—*
Domine, Daniel; and Hay, Leon,3,619,984.

Hayakawa Denki Kogyo Kabushiki Kaisha: *See—*
Washizuka, Isamu; Yoshida, Kunio; Kunikane, Akihiko; and Kitagawa, Yoshinobu, 3,621,219.

Hayashi, Masaaki: *See—*
Hosoya, Minoru; and Hayashi, Masaaki,3,619,953.

Hayashi, Sadashige, to Minolta Camera Kabushiki Kaisha. Exposure window system for electrostatic copier. 3,620,619, Cl. 355-8.

Hayashi, Toshio, to Minolta Camera Kabushiki Kaisha. System for indicating the distance limit for flash photography. 3,620,144, Cl. 95-11.

Hays, John A. Seed cotton roll boxes for cotton gin stands. 3,619,867, Cl. 19-55.

Hayssen Manufacturing Company: *See—*
Pringle, Frank E.; Wilson, David A.; and Cochrane, Richard H., 3,619,972.

Hazeltine Corporation: *See—*
Page, Charles E., 3,621,132.

Hazen, Stanley M.; and Heilman, William J., to Gulf Research & Development Company. Process for the production of foamed polyanhydride copolymers and products thereof. 3,620,990, Cl. 260-2.5

Hazzard, Harry I., to McCulloch Corporation. Centrifugal impregnator apparatus for impregnating electrical components. 3,619,865, Cl. 18-26.

Heap, Alec John, to Lucas, Joseph, (Industries) Limited. Ignition switch with blocking means. 3,621,159, Cl. 200-42.

Hearn, Charles L.; and Holmes, Charles S., to Cities Service Oil Company. Optimum oil recovery for carbon dioxide injection. 3,620,304, Cl. 336-205.

Hechenbleikner, Ingenuin; Hussar, John F.; Koeniger, Arthur F.; and Enlow, William P., to Carlisle Chemical Works, Inc. Substituted (4-benzoyl-2-hydroxy phenoxy) alkyl thioalkanoic acid esters. 3,621,051, Cl. 260-470.

Heckmann, Gunter, to Paul Forkardt Kommanditgesellschaft. Rotating double acting chuck cylinder for machine tools. 3,620,128, Cl. 91-446.

Heffner, George R., to Pullman Incorporated. Method of forming a foamed sandwich panel. 3,620,864, Cl. 156-79.

Heft, Eldon B.; and Humpage, Harold A., to General Electric Company. Electric circuit interrupter with novel arc gas discharge muffle assembly. 3,621,169, Cl. 200-144.

Heide, Horst: *See—*
Reinhardt, Gerd; Heide, Horst; and Flinspach, Sebastian,3,620,511.

Heidtmann, Donald S., to General Electric Company. Electronic dryer control. 3,621,293, Cl. 307-252.

Heilman, William J.: *See—*
Hazen, Stanley M.; and Heilman, William J.,3,620,990.

Heiney, Otto K.: *See—*
Paine, T. O., Administrator of the National Aeronautics and Space Administration with respect to an invention of.; and Heiney, Otto K.,3,619,924.

Hell, Rudolf, Kommanditgesellschaft: *See—*
Taudt, Heinz; and Keller, Hans, 3,621,126.

Heller, Hubert H.: *See—*
Durr, Alfred W.; Gunsser, Otto; and Heller, Hubert H.,3,620,109.

Heller, Stanley; and Shapiro, Wilbur, to United States of America, Air Force. Porous hydrostatic bearing. 3,620,581, Cl. 308-9.

Hellmer, Judy A.: *See—*
Isett, Donald D.; Hellmer, Judy A.; and Van Beek, Herman W.,3,621,208.

Hendershot, James R.; and Searle, Robert F., to Vibrac Corporation. Magnetic particle coupling. 3,620,335, Cl. 192-21.5

Henderson, John E., to Hamilton Watch Company. Self-compensating barometric fuze. 3,620,165, Cl. 102-70.

Hendrickson, Philip J.; and Resch, Richard J., to Krueger Metal Products, Inc. Chair base ganging fixture. 3,620,567, Cl. 297-248.

Henkel, Neville T.; Wright, Harry; and Scharer, Herman W., said Wright and said Scharer assors. to said Henkel. Metal bending method and machine therefor. 3,620,066, Cl. 72-362.

Henley, Eric Douglas; and Walker, George Eden, to Albright & Wilson Limited, and British Railways Board. Frictional retarding means. 3,620,334, Cl. 188-251.

Henry, Nelson R. Automatic filling and weighing mechanism. 3,620,317, Cl. 177-54.

Henry, Nelson R.; and Middour, Donald R., to Woodman Company, Inc., The. High speed classification and checkweighing system. 3,620,316, Cl. 177-50.

Herbert, Ronald M.: *See—*
Schindler, James C.; Weimer, Ralph E.; and Herbert, Ronald M.,3,620,156.

Herbrich, Horst, to Messer Griesheim GmbH. Apparatus for heat operating a workpiece with the aid of an optical projection of a radiation source. 3,621,198, Cl. 219-349.

Herchenroeder, Robert B.; Chow, Joe G. Y.; and Fleitman, Albert H., to United States of America, Atomic Energy Commission. Process for producing cobalt alloys. 3,620,852, Cl. 148-2.

Hercules Incorporated: *See—*
Klug, Eugene D.; Spurlin, Harold M.; and Young, William L., III, 3,620,970.

Hergenrother, Rudolf C., to Raytheon Company. Radiation sensitive mesh defect inspection system. 3,620,630, Cl. 356-237.

Herr, Charles H., to Caterpillar Tractor Company. Shift fork mechanism for drive transmissions. 3,620,097, Cl. 74-473.

Herring, James M., Jr.: *See—*
Eggert, Walter S., Jr.; and Herring, James M., Jr.,3,620,565.

Herrmann, Heinz Dieter: *See—*
Morrison, Alexander Robley; and Herrmann, Heinz Dieter,3,620,949.

Hertz, Jerome J.; and Salvadore, William E., to General Electric Company. Process for insolubilizing a polyphenylene ether fiber. 3,621,091, Cl. 264-290.

Hess, Nelson C.: *See—*
Morrissey, Richard T.; and Hess, Nelson C.,3,620,811.

Hess, Patrick Henry, to Chevron Research Company. Antiwetting method and compositions. 3,620,820, Cl. 117-124.

Hess, Paul D., to Aluminum Company of America. Magnesium removal from aluminum alloy scrap. 3,620,716, Cl. 75-68.

Hetterly, Ralph Milton: *See—*
Eckardt, Carl R.; Barton, Oliver Alfred; and Hetterly, Ralph Milton,3,620,860.

Hetzel, Frank L.; and Schy, Stuart T., to TRW Inc. Semiautomatic metal casting apparatus. 3,620,294, Cl. 164-155.

Hewlett-Packard Company: *See—*
Knudsen, Knud, 3,621,394.
Moffitt, Lee R., 3,621,325.
Yokoyama, Giichi; and Kameoka, Yoshihisa, 3,621,451.

Heybourne, Robert H.: *See—*
Clements, Herbert Arthur; and Heybourne, Robert H.,3,620,336.

Heynisch, Hinrich; Bittorf, Hannjorg; and Veith, Werner, to Printing Developments, Inc. Flat color television tube having plurality of mirror deflection systems. 3,621,319, Cl. 313-77.

Heyson, Harry H., to United States of America, National Aeronautics and Space Administration. Variable geometry wind tunnels. 3,620,076, Cl. 73-147.

Hi-Shear Corporation: *See—*
Batten, Ronald W., 3,620,105.

Hickin, George Keller: *See—*
Olivier, James Peter; and Hickin, George Keller,3,621,243.

Hiebert, Richard D.: *See—*
Jalbert, Roland A.; and Hiebert, Richard D.,3,621,238.

Higley, Wayne R.; Silcocks, Harry L.; and Waggoner, James A., to United States of America, Atomic Energy Commission. EKG amplifying electrode pickup. 3,620,208, Cl. 128-2.06

Higo, Suezi: *See—*
Takano, Ryoshiro; Ishii, Kunihiko; and Higo, Suezi,3,620,993.

Hilbert, Wolfgang, to Bunker-Ramo Corporation, The. Strain relief for electrical connectors. 3,621,413, Cl. 339-103.

Hilborn, John W.; Lennox, Colin G.; and Mathers, Wilson G., to United States of America, Atomic Energy Commission. Bed nuclear reactor. 3,620,916, Cl. 176-32.

Himes, Paul R. Device for trimming the outersides of carcasses. 3,620,275, Cl. 146-89.

Hindersinn, Raymond R.; Hopkins, George C.; and Ilardo, Charles S., to Hooker Chemical Corporation. 2,6-Diketo-N-carboxymethylmorpholine. 3,621,018, Cl. 260-247.2

Hinds, Fred C.; and Anthony, Donald R., to Atlantic Richfield Company. Corrosion resistant pipe joint system. 3,620,555, Cl. 285-55.

Hinrichs, Kurt; and Wilken, Gerd, to ERC Electronic Research Corporation. Stepping motor having positive, negative or zero potential applied to points of delta connected stator winding. 3,621,358, Cl. 318-696.

Hinsberger, Vincent: *See—*
Annas, Robert F.; and Hinsberger, Vincent,3,620,210.

Hinz, Arnulf: *See—*
Cremer, Joseph; Harnisch, Heinz; Schulte, Friedrich; and Hinz, Arnulf,3,620,753.

Hipwell, William Ernest Henry, to Marconi Company Limited, The. Colour television cameras. 3,621,122, Cl. 178-5.4

Hiraga, Ryo: *See—*
Takeuchi, Hisasuke; Sasaki, Ryoichi; Hataya, Humio; Hiraga, Ryo; Ishibashi, Eiichi; and Koyama, Takao,3,621,310.

Hirano, Chikafusa: *See—*
Tsuda, Junji; Iwata, Junzo; and Hirano, Chikafusa,3,621,227.

Hiraoka, Hideto, to Sanyo Electric Works Ltd. Process to improve magnetic characteristics of carbon steel. 3,620,856, Cl. 148-121.

Hirota, Ryoichi; Fujishima, Tohru; Miyazaki, Gentaro; Iwasaki, Tadahiko; Akatsu, Mitsuharu; and Kinoshita, Tomoo, to Hitachi, Ltd. High voltage regulation circuit for a color television receiver. 3,621,123, Cl. 178-5.40r

Hirschkorn, Ingo: *See—*
Grotkasten, Klaus; and Hirschkorn, Ingo,3,620,561.

Hirsh Company, The: *See—*
Ferdinand, Irwin J.; and Kulbersh, Irwin R., 3,620,176.
Ferdinand, Irwin J.; and Kulbersh, Irwin R., 3,620,588.

Hitachi Cable, Ltd.: *See—*
Sugiyama, Masao; Suzuki, Toshio; Noda, Hajime; Kashimura, Saburo; Hato, Shozo; and Tanaka, Hideo, 3,621,119.

Hitachi Electronics Company Limited: *See—*
Tsuda, Junji; Iwata, Junzo; and Hirano, Chikafusa, 3,621,227.

Hitachi, Ltd.: *See—*
Goto, Tatsuo; Matsudo, Yoryo; and Watanabe, Hiroshi, 3,621,351.
Hirota, Ryoichi; Fujishima, Tohru; Miyazaki, Gentaro; Iwasaki, Tadahiko; Akatsu, Mitsuharu; and Kinoshita, Tomoo, 3,621,123.
Nishimoto, Tetsunori, 3,621,218.
Sato, Hiroshi; and Toshima, Hisashi, 3,620,582.
Takeuchi, Hisasuke; Sasaki, Ryoichi; Hataya, Humio; Hiraga, Ryo; Ishibashi, Eiichi; and Koyama, Takao, 3,621,310.
Tsuda, Junji; Iwata, Junzo; and Hirano, Chikafusa, 3,621,227.
Yasuda, Kazuo; Uchino, Koichi; Nishiwaki, Koji; and Inomata, Hiroshi, 3,620,628.
Yoshioka, Yoshio, 3,621,171.

Hitchcock, Arthur A., to A.C.B. Corporation. Inertia switch. 3,621,163, Cl. 200-61.45

Hitchcock, Paul C., Sr., to Chase-Shawmut Company, The. Blown fuse indicator including a circuit- controlling switching device. 3,621,431, Cl. 337-5.

Hivert, Andre R.: *See—*
Galmiche, Philippe; Hivert, Andre R.; and Marty, Michel E.,3,620,720.

Hjortkjaer, Jes: *See—*
Petersen, Povl V.; Hansen, Villy H.; and Hjortkjaer, Jes,3,621,101.

Hlinsky, Emil J.; and Siblik, Allen D., to MacLean-Fogg Lock Nut Co. Convertible securement apparatus for securing standard containers and non-standard cargo on vehicles. 3,621,236, Cl. 296-35.00a

Ho, Eugene Y., to Farinon Electric. Phase detector and oscillator system. 3,621,452, Cl. 331-25.

Hobart, Stanley R.; McGregor, Howard H., Jr.; and Mack, Charles H., to United States of America, Agriculture. Phenyl-N-arylcabamates and a process of producing cellulose N-arylcarbamates therefrom. 3,620,664, Cl. 8-120.

Hobbs, James; Perkins, Earl Stuart; and Floyd, Donald E., to Butler National Corporation. Direction and ground speed computer. 3,621,212, Cl. 235-150.27

Hobrough, Gilbert L., to Itek Corporation. Transformation system. 3,621,326, Cl. 315-26.

Hocq, Robert R., to Societe Franco-Hispano-Americaine Francispam. Gas-fuelled devices. 3,620,015, Cl. 60-52.

Hodgson, Alfred W., to Westinghouse Electric Corporation. Modular high voltage electrical components cooperating within cabinet housing to provide electrical insulation and cooling air passage. 3,621,339, Cl. 317-103.

Hodgson, John Francis: *See—*
Bujwid, Zdzislaw Jan; and Hodgson, John Francis,3,621,042.

Hoelscher, Max W.; and Strubhar, Paul D., to RCA Corporation. Method for metallizing a ceramic body. 3,620,799, Cl. 117-22.

Hofer, Gerald; and Nothdurft, Heinz, to Bosch, Robert, G.m.b.H. Fuel injection system for internal combustion engines. 3,620,647, Cl. 417-293.

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Hofer, Peter H., to Union Carbide Corporation. Stamping process. 3,621,092, Cl. 264-322.

Hoffman, Ernest G.: *See—*
Szeluga, Ludwick; Hoffman, Ernest G.; and Sabo, Roland S.,3,620,447.

Hoffman, Harold A. High protein food. 3,620,755, Cl. 99-17.

Hofmann, Richard; and Wittmoser, Adalbert, said Hofmann, assor. to said Wittmoser. Magnetizable mass casting device. 3,619,866, Cl. 18-34.

Hofmann, Richard; and Wittmoser, Adalbert. Casting method. 3,620,286, Cl. 164-34.

Hogberg, Karl Gosta: *See—*
Davidsson, Per-Olof; and Hogberg, Karl Gosta,3,620,123.

Hogberg, Lars-Gunnar: *See—*
Eriksson, Erik Helmer; Hogberg, Lars-Gunnar; Kempe, Carl Peter Seth; and Lofgren, Stig-Gunnar,3,620,272.

Hogge, Ernest A., to United States of America, Navy. Athermal acoustic lens. 3,620,326, Cl. 181-0.5

Hohn, Gerhard; and Lingnau, Josef. Thermally controlled condensate trap. 3,620,449, Cl. 236-56.

Holbrook, LeGrand K.; and Ostler, David S., to Medical Development Corporation. Vacuum-filled fluid bottle and system. 3,620,408, Cl. 220-60.

Holcomb, Robert A., to General Electric Company. Lubricative atmosphere for sealed switches. 3,621,174, Cl. 200-168.

Holcombe, Edward L., to Grace, W. R., & Co. Method and apparatus for packaging. 3,619,969, Cl. 53-29.

Holes-Webway Co., The: *See—*
Chou, Tien S.; Tonnell, Wilfred T.; and Wenstrom, Roger A., 3,620,882.

Holland, Harold, to Republic Corporation. Key tag. 3,620,057, Cl. 70-456.

Holley Carburetor Company: *See—*
Smitley, Marion L., 3,620,324.

Hollyday, William C., Jr.; and Feldman, Nicholas, to Esso Research and Engineering Company. Fuel oil with improved flow properties. 3,620,696, Cl. 44-62.

Holmes, Alton B.: *See—*
Neisch, James C.; and Holmes, Alton B.,3,620,577.

Holmes, Charles S.: *See—*
Hearn, Charles L.; and Holmes, Charles S.,3,620,304.

Holt, Robert G.: *See—*
Stopka, Benjamin F.; Day, Dennis J.; Harmon, James V.; and Holt, Robert G.,3,620,631.

Holtz, Gilbert J. Closet accessory construction. 3,620,377, Cl. 211-177.

Honeywell Inc.: *See—*
Gould, Floyd T., 3,620,831.
Nelson, Clifford L.; and Sutton, David J., 3,620,448.
Robbins, Burnell N., 3,620,073.

Honjo, Satoru: *See—*
Tamai, Yasuo; and Honjo, Satoru,3,620,800.

Honjo, Satoru; Tamai, Yasuo; Sato, Masamichi; and Matsumoto, Seiji, to Fuji Shashin Film Kabushiki Kaisha. Development of latent electrostatic image employing novel development electrode. 3,620,798, Cl. 117-17.5

Honnen, Lewis R.; and Bakker, Nicolaas, to Chevron Research Company. Reaction product of alkylene polyamines and chlorinated alkenyl succinic acid derivatives. 3,620,977, Cl. 252-51.5

Honsyo, Yoshio: *See—*
Akuta, Tomohiko; Honsyo, Yoshio; and Hashirizaki, Shinya,3,621,266.

Hood, Larry H.; Rose, LeRoy; and Starks, Charles M., to Continental Oil Company. Apparatus for plating aluminum on wire. 3,620,189, Cl. 118-620.

Hook, David Ellis: *See—*
Bunting, William Wallar, Jr.; Evans, Franklin James; and Hook, David Ellis,3,620,903.

Hooker Chemical Corporation: *See—*
Duffy, James J., 3,620,834.
Hindersinn, Raymond R.; Hopkins, George C.; and Ilardo, Charles S., 3,621,018.
Oei, Han Yong; and Moller, Siegfried, 3,620,822.
Okabe, Masanaga; Yoshihara, Toshio; and Hamaoka, Kenji, 3,620,777.
Weil, Edward D.; and Gomlak, Norman H., 3,620,994.

Hoover Company, The: *See—*
Dunn, Harold George, 3,620,053.

Hope Kabushiki Kaisha: *See—*
Shinohara, Kesao, 3,620,544.

Hope, Karl. Synchronized stereoscopic system. 3,621,127, Cl. 178-6.5

Hopkins, George C.: *See—*
Hindersinn, Raymond R.; Hopkins, George C.; and Ilardo, Charles S.,3,621,018.

Hopper, Mitchell C. Microfiche handler. 3,620,612, Cl. 353-27.

Horecky, Stanley V.; and McDonough, Cletus, to Molex Products Company. Printed circuit board lead wire receptacle. 3,621,445, Cl. 339-17.

Horizons Incorporated: *See—*
Fichter, Harry L., Jr., 3,620,748.

Horlacher, Herman: *See—*
Perry, Charles B.; and Horlacher, Herman,3,619,898.

Hornung, Richard J. Double fold frame structure. 3,620,550, Cl. 280-476.

Horrocks, Raymond G., to Scott & Fetzer Company, The. Tool for removing covering material from an electrically conductive cable. 3,620,104, Cl. 81-9.5

Horsey, William C.; Samson, Robert H.; and McCauley, Don O., to Westinghouse Electric Corporation. X-ray tire inspection apparatus. 3,621,246, Cl. 250-52.

Hosoya, Minoru; and Hayashi, Masaaki, to Kao Soap Co., Ltd. Apparatus for rounding end of flexible plastic wire. 3,619,953, Cl. 51-145.

Hostetler, Jeffrey D.: *See—*
Barrow, Robert B.; and Hostetler, Jeffrey D.,3,620,288.

Hough, Harold L.; and Foss, Charles W., to Sylvania Electric Products Inc. Automotive driving light. 3,621,232, Cl. 240-35.

Houlihan, William J., to Sandoz-Wander, Inc. 5-Hydroxyamino-1,3-dioxanes. 3,621,033, Cl. 260-332.3

Houlihan, William J.; and Manning, Robert E., to Sandoz-Wander, Inc. Substituted benzylideneamino guanidines. 3,621,056, Cl. 260-545.

Houpt, Grover K., to Automatic Timing & Controls, Inc. Rapid reset timing circuit employing current supply decoupling. 3,621,304, Cl. 307-293.

Hovorka, Reiner, to Langen & Company. Level control assemblage for vehicles. 3,620,542, Cl. 280-6.1

Howard, Sol; and Schaaf, Robert, to Mil-An Mfg., Corporation. Vacuum cleaner bag. 3,619,989, Cl. 55-368.

Howell, Edmund O.: *See—*
Brelsford, John E.; and Howell, Edmund O.,3,619,992.

Hradel, Joseph R.; and Staadt, Harold E., to Dow Chemical Company, The. Ammonium nitrate explosive composition. 3,620,858, Cl. 149-21.

Hron, Roland L.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,621,372.

Hubbard, Ronald R.; and Blumenfeld, Klaus H., to Anaconda Wire and Cable Company. Cable reel. 3,620,471, Cl. 242-118.6

Hubbell, Harvey, Incorporated: *See—*
Burns, Edward P.; and Lee, Sung C., 3,621,334.

Huber, James A.: *See—*
Stump, Paul W.; Huber, James A.; and Lipinski, John M.,3,620,869.

Hubertus, Wash: *See—*
Link, Donald A.; Hubertus, Wash; and Williams, Fred H.,3,621,189.

Hudnall, Joseph R.; and Wergin, Paul C., to Western Electric Company, Incorporated. Film resistor adjustable by isolating portions of the film. 3,621,441, Cl. 338-195.

Hudson, Robert, Limited: *See—*
Greenwood, Fred, 3,620,392.

Hudson, Ronald Augustus: *See—*
Ford, Andrew George; and Hudson, Ronald Augustus,3,620,774.

Hufton, Peter Frederick, to International Combustion (Holdings) Limited. Fluid flow apparatus. 3,620,651, Cl. 417-436.

Hugh Steeper (Roehampton) Limited: *See—*
Collins, Dennis W., 3,619,818.

Hughes Aircraft Company: *See—*
Cabezas, Amado Y.; and Koechner, Walter, 3,621,458.
Ma, Stephen P. F., 3,621,280.

Hughes Tool Company: *See—*
Cunningham, Robert A., 3,620,580.

Huisman, Henderikus Obias: *See—*
Pandit, Upendra Kumar; and Huisman, Henderikus Obias,3,621,019.

Hull, Francis R. Marine jet propulsion system. 3,620,183, Cl. 114-151.

Humpage, Harold A.: *See—*
Heft, Eldon B.; and Humpage, Harold A.,3,621,169.

Humphlett, Wilbert J.: *See—*
Haist, Grant M.; Humphlett, Wilbert J.; and King, James R.,3,620,749.

Humphrey, Lawrence F., to Stauffer Chemical Company. Process of producing trialkyl phosphites. 3,621,084, Cl. 260-976.

Humphrey, Norman J. Folder with elastic band. 3,620,440, Cl. 229-72.

Humphrey, William E., to Optical Research and Development Corporation. Optical stabilizer having hydraulically moved light deflecting lenses. 3,620,594, Cl. 350-16.

Hunter, Irving R.; and Walden, Mayo K., to United States of America, Agriculture. 1,4,5,6-Tetrahydro-2-acetopyridine and salts thereof as flavoring agents. 3,620,771, Cl. 99-140.

Hussar, John F.: *See—*
Hechenbleikner, Ingenuin; Hussar, John F.; Koeniger, Arthur F.; and Enlow, William P.,3,621,051.

Huver, Ben, 50% to Korn, Daniel J., Sr. Warden, Merritt N., and Walterskirchen, Wm. C. Gun hanger. 3,620,493, Cl. 248-360.

Hwoschinsky, Vladimir; Nelson, James E.; and Westcott, Paul W., to A-T-O Inc. Gas generator. 3,620,683, Cl. 23-281.

Hydrel AG. Maschinenfabrik: *See—*
Fuhrimann, Paul, 3,620,126.

Hydrotile Machinery Company: *See—*
Fosse, Navarro T., 3,619,872.

Hygrade Foods Inc.: *See—*
Wallace, William R. J., 3,620,431.

Hylen, Lyle L., to Westinghouse Air Brake Company. Trailable railway switch machine. 3,621,237, Cl. 246-411.

I-T-E Imperial Corporation: *See—*
Jensen, Otto, 3,621,170.

Iceland, William F.; and Lien, Donald R., to North American Rockwell Corporation. Welding system. 3,621,185, Cl. 219-130.

Ichijo, Bunjiro, to Kett Electric Laboratory. Meter for measuring capacitances of extremely high loss dielectric materials. 3,621,385, Cl. 324-60.

Ichikawa, Rinjiro, to Toyo Boseki Kabushiki Kaisha. Production of light-polarizing film. 3,621,085, Cl. 264-2.

Iikubo, Yuichi; Nishida, Takuji; and Furukawa, Yoshiki, to Onoda Cement Company, Limited. Method of purifying vinyl fluoride contaminated with impurites by distillation in the presence of carbon dioxide or trifluoromethane. 3,620,030, Cl. 62-11.

IIT Research Institute: *See—*
Epstein, Max; Fryberger, David; Serafin, Robert J.; and Van Den Heuvel, Anthony P., 3,621,328.

Ikezu, Yohei: *See—*
Ataka, Hisanori; and Ikezu, Yohei,3,620,147.

Ilardo, Charles S.: *See—*
Hindersinn, Raymond R.; Hopkins, George C.; and Ilardo, Charles S.,3,621,018.

Iles, Kenneth E.; Jung, Harry J.; and Arell, Elmo R., to FMC Corporation. Constant space article singulator. 3,620,526, Cl. 271-26.

Ilgen, Erich; and Michl, Horst, to Kalle Aktiengesellschaft. Process for shirring artificial sausage casings. 3,619,854, Cl. 17-42.

Imamura, Hitoshi; and Ishino, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Apparatus for continuously determining the diameter of mask apertures. 3,620,879, Cl. 156-345.

Imperial Chemical Industries Limited: *See—*
Edgar, Owen Burchell; and Yates, Michael Richard, 3,621,089.
Ford, Andrew George; and Hudson, Ronald Augustus, 3,620,774.
Newton, Frank, 3,620,282.
White, Brian Graham, 3,620,711.

Imperial Metal Industries (Kynoch) Limited: *See—*
Sindall, John Henry; and Dixon, Frederick Charles, 3,620,237.

Industrial Magnetics, Inc.: *See—*
Prevett, Peter Dominec; and Morin, Theodore Joseph, 3,621,175.

Industrial Nucleonics Corporation: *See—*
Eddy, William C., Jr., 3,621,252.
Figueroa, Carlos G., 3,620,794.
Rocheleau, Antoni A., 3,620,914.

Infonics, Inc.: *See—*
Cervantes, Felipe, 3,620,476.

Ingenjorsfirma Hebe AB: *See—*
Bergling, Charles Gunnar Birger, 3,620,382.

Ingersoll-Rand Company: *See—*
Krasnoff, Eugene L., 3,620,312.

Ingram, David John; and Eagles, Geoffrey James. Brick handling apparatus. 3,620,383, Cl. 214-6.

Inomata, Hiroshi: *See—*
Yasuda, Kazuo; Uchino, Koichi; Nishiwaki, Koji; and Inomata, Hiroshi,3,620,628.

Inous, Kiyoshi. Method of and apparatus for the deburring of workpieces. 3,620,953, Cl. 204-202.

Institut de Recherches de la Siderurgie Francaise: *See—*
Denis, Michel; and Barillot, Maurice, 3,620,946.

Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Jacques, Gabriel; Zuech, Alphonse; Convers, Alain; and Paumier, Jacques, 3,621,068.
Renault, Philippe; Falcon, Serge; Chavin, Jean-Claude; and Deschamps, Andre, 3,620,674.

Institut fur Silikon- und Fluorkarbon-Chemie: *See—*
Muller, Richard; Irmisch, Reiner; and Rotzsche, Harald, 3,621,045.

International Business Machines Corporation: *See—*
Baumann, Gerald W.; Norwood, Richard E.; and Rueger, William J., 3,620,430.
Chang, Joseph J.; and Vora, Madhukar B., 3,621,346.
Clancy, Douglas E.; and O'Daniel, Jerome B., 3,620,344.
Comstock, Richard Lawrence; and Moore, Eugene B., 3,620,841.
Fitzgerald, Richard J.; Jacobsen, Ronald R.; and Rueger, William J., 3,620,478.
Jen, Dian P.; Slocum, Richard A.; and Valentino, Carl R., 3,621,213.
Jen, Teh-Sen; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., 3,621,279.
Kelly, Michael J.; and Shlatz, Myron F., 3,620,617.
Leff, Jerry; and Roberts, Arthur A., 3,620,837.
Murray, Jack T., 3,621,389.
Pricer, Wilbur David, 3,621,302.
Tomczak, James J., 3,621,301.
Wenner, John W., 3,621,153.
Wortzman, Donald, 3,621,216.

International Combustion (Holdings) Limited: *See—*
Hufton, Peter Frederick, 3,620,651.

International Flavors & Fragrances, Inc.: *See—*
Grossman, James D., 3,620,982.
Rachlin, Stanley, 3,621,070.

International Harvester Company: *See—*
Cary, Robert P.; and Cary, Philip E., 3,620,068.
Fischer, Raymond C., 3,619,917.

International Minerals & Chemical Corporation: *See—*
Petkovsek, John M.; and Rodriguez, Carlos O., 3,620,709.

International Standard Electric Corporation: *See—*
Craven, George Frederick, 3,621,483.
Friedrich, Kurt; and Straimer, Georg, 3,621,268.
Verstegen, Willi, 3,621,145.

International Telephone and Telegraph Corporation: *See—*
Arnold, Bruce K.; and Paugh, Edward C., 3,621,448.
Beck, Roland D., 3,621,432.
Beelik, Andrew; and Wilson, Jim D., 3,620,912.
Durand, John E., 3,621,168.
Jovic, Nikola L.; and Keough, Timothy J., 3,621,144.
Keller, William F.; and Domyan, Frank F., 3,620,185.
Meeks, Gene A., 3,621,454.
Rabow, Gerald; and Klein, Albert M., 3,621,399.

Iowa State University Research Foundation: *See—*
Quick, Graeme R.; and Brandini, Adhemar, 3,620,224.

Iowa State University Research Foundation, Inc.: *See—*
Sinclair, John C., 3,620,207.

Ireland, Henry R., to Mobil Oil Corporation. Method of producing a jet fuel. 3,620,961, Cl. 208-79.

Irion, Eckart: *See—*
Wagner, Otto; Bauer, Klaus; Kaufmann, Wilfried; Rauenbusch, Erich; Arens, Alfred; and Irion, Eckart,3,620,926.

Irmisch, Reiner: *See—*
Muller, Richard; Irmisch, Reiner; and Rotzsche, Harald,3,621,045.

Irontite Products Co. Inc.: *See—*
Roeschlaub, Ronald C., 3,619,892.

Irwin, John M.: *See—*
Fawcett, James W.; Irwin, John M.; and McFadyen, Robert J.,3,621,354.

Isaacs, Hugh Solomun; and Singer, Robert M., to United States of America, Atomic Energy Commission. Chemical polishing of metallic sodium. 3,620,859, Cl. 156-20.

Isett, Donald D.; Hellmer, Judy A.; and Van Beek, Herman W., to Texas Instruments, Incorporated. Signal point interconnection routing. 3,621,208, Cl. 235-150.

Ishibashi, Eiichi: *See—*
Takeuchi, Hisasuke; Sasaki, Ryoichi; Hataya, Humio; Hiraga, Ryo; Ishibashi, Eiichi; and Koyama, Takao,3,621,310.

Ishidate, Morizo; and Yusawa, Kenji, to Zaiden Hojin Tokyo Seikagaku. PPD-S (tuberculin protein) combined with glucuronic acid and method for preparing the same. 3,621,005, Cl. 260-112.

Ishii, Kunihiko: *See—*
Takano, Ryoshiro; Ishii, Kunihiko; and Higo, Suezi,3,620,993.

Ishino, Hiroshi: *See—*
Imamura, Hitoshi; and Ishino, Hiroshi,3,620,879.

Isom, Warren Rex, to RCA Corporation. Endless loop tape cartridge. 3,620,467, Cl. 242-55.19

Itadani, Sotaro: *See—*
Tanimoto, Katsukiyo; Urakami, Tamio; and Itadani, Sotaro,3,620,897.

Itek Corporation: *See—*
Carlsen, Walter N., 3,621,405.
Hobrough, Gilbert L., 3,621,326.
Wong, Hans K., 3,620,738.

Ito, Shinichi: *See—*
Tomita, Yukio; Ito, Shinichi; Sogo, Yoshitaka; and Morino, Hideki,3,620,338.

Ivanhoe Research Corporation: *See—*
Hawley, George F., 3,620,525.

Ivashkov, Ilya Ilich; and Frolovtsev, Vasily Alexandrovich. Flat-link chain. 3,620,094, Cl. 74-251.00r

Iwanami, Masaru: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Mashiro; and Arima, Hideki,3,621,058.

Iwasaki, Tadahiko: *See—*
Hirota, Ryoichi; Fujishima, Tohru; Miyazaki, Gentaro; Iwasaki, Tadahiko; Akatsu, Mitsuharu; and Kinoshita, Tomoo,3,621,123.

Iwata, Junzo: *See—*
Tsuda, Junji; Iwata, Junzo; and Hirano, Chikafusa,3,621,227.

Jache, Albert W.: *See—*
Faust, John P.; Jache, Albert W.; and Klanica, Andrew J.,3,620,689.

Jackson, Geoffrey Norman: *See—*
Emery, John Arthur Alfred; Jackson, Geoffrey Norman; and Priestland, Colin Richard Douglas,3,620,957.

Jackson Manufacturing Co.: *See—*
Lynch, William C., 3,620,364.

Jacob, Francis J.: *See—*
Sterrett, Robert W.; Jacob, Francis J.; and Chemberlain, Merle D.,3,619,961.

Jacobsen, Ronald R.: *See—*
Fitzgerald, Richard J.; Jacobsen, Ronald R.; and Rueger, William J.,3,620,478.

Jacobson, Charles R., deceased (by Jacobson, Annie T., heir); D'Adamo, Anthony; and Cosgrove, Charlotte E. Therapeutic compositions and methods for stimulating the central nervous system. 3,621,099, Cl. 424-269.

Jacobson, Chester F.; and Kexel, Edward P., to General Electric Company. Mower apparatus. 3,619,996, Cl. 56-13.6

Jacobson, Nils Bertil: *See—*
Tysk, Jan Erik; Olofsson, Sven Skalby; and Jacobson, Nils Bertil,3,620,215.

Jacquemet, Andre: *See—*
Torelli, Aldo; and Jacquemet, Andre,3,620,158.

Jacques, Gabriel; Zuech, Alphonse; Convers, Alain; and Paumier, Jacques, to Institut Francais du Petrole des Carburants et Lubrifiants. Manufacture of naphthenic hydrocarbons by hydro- genating the corresponding aromatic hydrocarbons. 3,621,068, Cl. 260-667.

Jaffe, Joseph: *See—*
Bridge, Alan G.; Jaffe, Joseph; and Mitchell, David S.,3,620,968.

Jagger, Ernest T.; Halliday, Geoffrey W.; and Harrison, Frank, to Angus, George, & Company Limited. Shaft seals. 3,620,540, Cl. 277-134.

Jakas, Rimvydas P.; and Mullin, Joseph V., to United States of America, Navy. Fiber aligning apparatus. 3,619,869, Cl. 19-156.3

Jalbert, Roland A.; and Hiebert, Richard D., to United States of America, Atomic Energy Commission. Gamma insensitive air monitor for radioactive gases. 3,621,238, Cl. 250-83.6

Jan Marcel Didier Aron-Samuel: *See—*
Scott, John F., 3,621,097.

Janetos, Nicholas S.; Marzocchi, Alfred; and Leary, David E., to Owens-Corning Fiberglas Corporation. Method for treating and impregnating glass fiber bundles for reinforcement of elastomeric materials and product. 3,620,701, Cl. 65-3.

Janning, John L., to National Cash Register Company, The. Stacked plate visual display panel. 3,621,332, Cl. 315-313.

Japan Bicycle Promotion Institute: *See—*
Hasegawa, Kazuaki; Nozaki, Kanzo Kawaguchi; and Yokoyama, Katsuyoshi, 3,620,281.

Jaspers, Hendrik Alphons; and Abrahams, Jacobus Hubertus, to U.S. Philips Corporation. Compressor with rolling diaphragm seal. 3,620,652, Cl. 417-439.

Jaycox, Richard L.: *See—*
Canning, Terry D.; and Jaycox, Richard L.,3,621,210.

Jehenson, Pierre: *See—*
Gualandi, Dante; and Jehenson, Pierre,3,619,894.

Jen, Dian P.; Slocum, Richard A.; and Valentino, Carl R., to International Business Machines Corporation. Programmed digital computer controlled system for automatic growth of semiconductor crystals. 3,621,213, Cl. 235-150.

Jen, Teh-Sen; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., to International Business Machines Corporation. High density dynamic shift register. 3,621,279, Cl. 307-221.

Jenkins, Merrill M. Money handling device. 3,620,340, Cl. 194-9.

Jennings, Roy E., to Royal Seating Corporation. Leg connector assembly. 3,620,492, Cl. 248-188.

Jensen, Melvin J.: *See—*
Jerome, Wallace H.; and Jensen, Melvin J.,3,620,351.

Jensen, Norman P.; and Windholz, Thomas B., to Merck & Co., Inc. Derivatives of zearalane. 3,621,036, Cl. 260-343.2

Jensen, Otto, to I-T-E Imperial Corporation. Gas-filled separable contacts for high voltage switchgear. 3,621,170, Cl. 200-148.

Jerome, Wallace H.; and Jensen, Melvin J., said Jensen assor. to said Jerome. Conveying and storage apparatus. 3,620,351, Cl. 198-129.

Jeserich, Wolfgang-Dieter: *See—*
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; Jeserich, Wolfgang-Dieter; and Reichel, Bernd,3,621,001.

Jirou, Marcel Georges; and Brouard, Claude Marie Henri Emile, to Ugine Kuhlmann. Mixed chromium monoazo dye complexes. 3,621,006, Cl. 260-145.

J&L Engineering Company, Inc.: *See—*
Steen, Albert C.; and Steen, John W., 3,620,369.

Jogerst, David J. Apparatus for balancing small wheels gears, and the like. 3,620,086, Cl. 73-483.

John, Robert S., Jr., to Bell & Howell Company. Automatic projector-recorder synchronizer. 3,620,609, Cl. 352-17.

Johns, Carl E.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,621,406.

Johns-Manville Fiber Glass Inc.: *See—*
Hannes, George John, 3,620,906.

Johnson, Arlen Kent; and Zysman, George Isaac, to Bell Telephone Laboratories, Incorporated. Suspended substrate transmission lines having coupled center conductors. 3,621,478, Cl. 333-10.

Johnson, David C.: *See—*
Bauer, Randy L.; Johnson, David C.; and Noss, Ronald M.,3,620,804.

Johnson, Gordon C., to Union Carbide Corporation. Treatment of fibers with siloxane-polyoxyalkylene block copolymers containing methoxysiloxy groups. 3,620,821, Cl. 117-126.

Johnson, Keith O., to MCA Technology, Inc., mesne. Electromagnetic record head transducer and system. 3,621,148, Cl. 179-100.2

Johnson, Kenneth R.; Tyson, W. Gerald; and Soroka, Joe F., to Riegel Paper Corporation. Machine for packaging product in a controlled atmosphere. 3,619,975, Cl. 53-112.

Johnson, Robert B.: *See—*
Theys, Ezra E.; Morse, Hugh B.; and Johnson, Robert B.,3,619,977.

Johnson, Ronald L.: *See—*
Watson, Edward; Wilkins, Dennis M.; and Johnson, Ronald L.,3,621,379.

Johnston, Phillip A.; and Gelezunas, Vincent L., to United States of America, Atomic Energy Commission. Beta particle detection in thin nuclear detectors. 3,621,257, Cl. 250-83.

Johnston, Robert L.; and Chambers, Wallace G., to Westinghouse Electric Corporation. Electrical windings and method of constructing same. 3,621,428, Cl. 336-146.

Jones, George H. Solid-state, electronic timer. 3,621,305, Cl. 307-293.

Jones, Ivor Wynford, to Carrier Engineering Company Limited. Cathode cell. 3,620,955, Cl. 204-283.

Jones, John Leslie, Jr.: *See—*
Jones, John Leslie, Sr.; and Jones, John Leslie, Jr.,3,620,891.

Jones, John Leslie, Sr.; and Jones, John Leslie, Jr. Receipt binders. 3,620,891, Cl. 161-38.

Jones, John Windsor, to Rolls-Royce Limited. Cooling of aerofoil shaped blades. 3,620,643, Cl. 416-90.

Jones, Judson O. Wet pick-up portable cleaning apparatus. 3,619,849, Cl. 15-321.

Jones, Morris C., Jr.; and La Pan, Gary Eugene, to Baker Perkins, Inc. Corner conveyor. 3,620,355, Cl. 198-182.

Jones, Morton W. Cage door handle and latch assembly. 3,620,559, Cl. 292-76.

Joseph A David, to Eutectic Corporation. Welding electrode. 3,621,188, Cl. 219-146.

Joslyn Mfg. and Supply Co.: *See—*
Duvendack, William H., 3,621,107.

Jovic, Nikola L.; and Keough, Timothy J., to International Telephone and Telegraph Corporation. Call originating control for electronic telephone systems. 3,621,144, Cl. 179-18.

Jules, Andre, to Compagnie Generale d'Electricite. Apparatus for obtaining an electric discharge in a conductive liquid medium, more particularly for electric sea fishing. 3,621,368, Cl. 322-18.

Junemann, Hubert, to Kochs Adlernahmaschinen Werke AG. Trimming device for trimming the edges of workpiece cuts. 3,620,112, Cl. 83-98.

Jung, Harry J.: *See—*
Iles, Kenneth E.; Jung, Harry J.; and Arell, Elmo R.,3,620,526.

Jung, Johann: *See—*
Zeidler, Adolf; Koenig, Karl-Heinz; Fischer, Adolf; and Jung, Johann,3,621,017.

Juraschek, Richard: *See—*
Kannegiesser, Herbert; Niederst, Jean Pierre; and Juraschek, Richard,3,620,881.

Jureit, John C.; Csakvary, Oscar; Castillo, Adolfo; Kushner, Benjamin H.; and Karch, Otto J., to Automated Building Components, Inc. Automated saw. 3,620,270, Cl. 143-47.

Kabushiki Kaisha: *See—*
Miyamoto, Ryou; Hashizume, Kunio; and Kitamura, Hiroshi, 3,620,662.

Kabushiki Kaisha Hattori Tokeiten: *See—*
Kawamura, Toshiki; Ohneda, Tohru; Nomura, Yasuaki; and Taguchi, Kikuo, 3,620,445.
Kitai, Kiyoshi, 3,620,151.

Kabushiki Kaisha Komatsu Seisakusho Minato-Ku: *See—*
Uchida, Toshiyuki; Miyakoshi, Hisashi; and Murai, Shinichi, 3,621,348.

Kabushiki Kaisha Meidensha: *See—*
Murayama, Yoshio; and Kamura, Masao, 3,621,314.

Kabushiki Kaisha Ricoh: *See—*
Ataka, Hisanori; and Ikezu, Yohei, 3,620,147.
Kubo, Keishi; and Sakai, Kiyoshi, 3,620,160.
Yamaguchi, Nario; and Tubuko, Kazuo, 3,620,723.

Kaida, Tsunetoshi: *See—*
Ono, Nobujiro; Hattori, Hiroshi; Tada, Shoji; and Kaida, Tsunetoshi,3,621,009.

Kallas, William C., to Klefstad Engineering Co., Inc., mesne. Chip dryer device. 3,619,907, Cl. 34-44.

Kallas, William C., to Klefstad Engineering Co., Inc., mesne. Device for cleaning and drying metal chips and blends with quaternary nitrogen group ontaining. 3,619,908, Cl. 34-56.

Kalle Aktiengesellschaft: *See—*
Ilgen, Erich; and Michl, Horst, 3,619,854.
Lohmann, Harald; and Diener, Horst, 3,620,825.
Steppan, Hartmut; Rauterkus, Karl Josef; and Seip, Detlev, 3,620,732.
Steppan, Hartmut; Messwarb, Gunter; and Luders, Walter, 3,620,733.

Kameoka, Yoshihisa: *See—*
Yokoyama, Giichi; and Kameoka, Yoshihisa,3,621,451.

Kamura, Masao: *See—*
Murayama, Yoshio; and Kamura, Masao,3,621,314.

Kanbayashi, Naohiko, to TDK Electronics Company Ltd. Circulator having heat dissipating plate. 3,621,476, Cl. 333-1.1

Kanegafuchi Boseki Kabushiki Kaisha: *See—*
Tamura, Yoshio; and Ando, Satoshi, 3,620,904.

Kaneko, Takashi: *See—*
Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi,3,620,227.

Kanemitsu, Tsunetoshi; and Asakura, Yukio, to Taiyo Fishery Co. Ltd. Process for preparing a water-containing feed for cultivating macrura and product. 3,620,754, Cl. 99-3.

Kannegiesser, Herbert; Niederst, Jean Pierre; and Juraschek, Richard, to Kannegiesser Maschinenfabrik Gesellschaft mit beschrankter Haftung. Apparatus for printing both sides of single or multiple layer textile articles. 3,620,881, Cl. 156-388.

Kannegiesser Maschinenfabrik Gesellschaft mit beschrankter Haftung: *See—*
Kannegiesser, Herbert; Niederst, Jean Pierre; and Juraschek, Richard, 3,620,881.

Kao Soap Co., Ltd.: *See—*
Hosoya, Minoru; and Hayashi, Masaaki, 3,619,953.

Kapare, Erik Gunnar, to Billeruds Aktiebolag. Method and apparatus for packing small packages having varying configuration and containing root-crops into larger receptacle. 3,619,968, Cl. 53-26.

Kappenhagen, George A., to Westinghouse Electric Corporation. Solid state photocontrol housing assembly with external heat disipating ribs. 3,621,337, Cl. 317-100.

Karch, Otto J.: *See—*
Jureit, John C.; Csakvary, Oscar; Castillo, Adolfo; Kushner, Benjamin H.; and Karch, Otto J.,3,620,270.

Karlsson, Lars Anders: *See—*
Martensson, Kjell Halvard; and Karlsson, Lars Anders,3,619,979.

Kashimura, Saburo: *See—*
Sugiyama, Masao; Suzuki, Toshio; Noda, Hajime; Kashimura, Saburo; Hato, Shozo; and Tanaka, Hideo,3,621,119.

Kasperkovitz, Wolfdietrich, to U.S. Philips Corporation. Semiconductor device having a bistable circuit element. 3,621,345, Cl. 317-235.

Kato, Norio: *See—*
Tanito, Keiko; Kato, Norio; Kinoshita, Shosaku; Kinoshita, Masahiro; and Sunada, Tsuyoshi,3,620,944.

Kato, Shoichi: *See—*
Sawada, Kingo; Kato, Shoichi; and Ota, Tadashi,3,619,888.

Katsurazawa Denki Kabushiki Kaisha: *See—*
Miyakawa, Seiichi, 3,621,244.

Katumata, Hideo: *See—*
Mochizuki, Kazuo; Otsuka, Hiroyasu; Katumata, Hideo; Oka, Tetuo; and Tanaka, Masao,3,620,925.

Kauffman, Robert C. Watch winding apparatus. 3,620,007, Cl. 58-80.

Kaufmann, Wilfried: *See—*
Wagner, Otto; Bauer, Klaus; Kaufmann, Wilfried; Rauenbusch, Erich; Arens, Alfred; and Irion, Eckart,3,620,926.

Kawabata, Minoru, to Toyoda Koki Kabushiki Kaisha. Fluid control system comprising a viscosity compensating device. 3,620,238, Cl. 137-81.5

Kawaguchi, Munetaka: *See—*
Matsummura, Shigeru; Asano, Nobuyuki; and Kawaguchi, Munetaka,3,620,996.

Kawamura, Toshiki; Ohneda, Tohru; Nomura, Yasuaki; and Taguchi, Kikuo, to Kabushiki Kaisha Hattori Tokeiten. Calculating mechanism for calculating machine. 3,620,445, Cl. 235-60.2

Kawazu, Motoaki, to Ricoh Co., Ltd. Variable-magnification afocal optical lens system. 3,620,602, Cl. 350-184.

Kaye, Arthur, J.: *See—*
Kaye, J. Arthur; and Lentz, Morgan E., 3,620,638.

Kaye, J. Arthur; and Lentz, Morgan E., to Kaye, Arthur, J. Liquid propulsion device. 3,620,638, Cl. 415-106.

KDI Corporation: *See—*
Shekro, Christe M., 3,620,163.

Keast, Russell Raymond: *See—*
Corliss, Duncan Simmons; Keast, Russell Raymond; and Saxman, Richard Lewis,3,620,979.

Keeling, Richard W., deceased (by Keeling, Katie Vee, executrix); Gilbreath, Cecil R.; and Stamps, Virgil O., to Geo Space Corporation. Method and apparatus for selecting active filter systems. 3,621,412, Cl. 330-107.

Keen, John Michael Storer; Byett, Maurice John; and Weston, Francis Anthony, to Rolls-Royce Limited. Bearing assembly. 3,620,641, Cl. 415-170.

Kefalas A/S: *See—*
Petersen, Povl V.; Hansen, Villy H.; and Hjortkjaer, Jes, 3,621,101.

Keller, Carol K.; and Forest, Edward, to Xerox Corporation. Electrophoretic imaging employing periodic electromagnetic radiation. 3,620,950, Cl. 204-181.

Keller, Ervin J. Plastic raft. 3,619,833, Cl. 9-11.

Keller, Hans: *See—*
Taudt, Heinz; and Keller, Hans,3,621,126.

Keller, Rudolf: *See—*
Burke, Arthur J.; and Keller, Rudolf,3,619,981.

Keller, William F.; and Domyan, Frank F., to International Telephone and Telegraph Corporation. Hydraulic control system. 3,620,185, Cl. 116-125.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Apparatus for producing rod-shaped members of crystalline material. 3,620,682, Cl. 23-273.

Kelley, Louis E.; Alexander, Raymond B.; and Sioma, Edward M., to Rohm and Haas Company. Testing materials for resilience and stiffness. 3,620,071, Cl. 73-99.

Kelly, Gilbert H.: *See—*
Coburn, Herbert D.; and Kelly, Gilbert H.,3,620,328.

Kelly, Michael J.; and Shlatz, Myron F., to International Business Machines Corporation. Electrophotographic apparatus with improved toner transfer. 3,620,617, Cl. 355-3.

Kelly, Peter Bernard; and Grosheim, Gene Edward, to Formica Corporation. Decorative laminate back coated with a polyvinyl acetate composition. 3,620,899, Cl. 161-162.

Kelly, Samuel C.: *See—*
Colvin, Oliver D.; Taylor, Robert A.; and Kelly, Samuel C.,3,619,987.

Kemmler, James W., to New London Mills, Inc. Floor and wall covering and method of making same. 3,620,890, Cl. 161-6.

Kempe, Carl Peter Seth: *See—*
Eriksson, Erik Helmer; Hogberg, Lars-Gunnar; Kempe, Carl Peter Seth; and Lofgren, Stig-Gunnar,3,620,272.

Kennedy, David Rankine: *See—*
Boutle, David Leonard; Clachan, Margaret Loudon; and Kennedy, David Rankine,3,620,812.

Kennedy, Paul G., to Westinghouse Electric Corporation. FM demodulator. 3,621,408, Cl. 329-103.

Kennington, Arnold Reginald, to Donka N.V. Apparatus for automatically processing photographic film or paper. 3,620,153, Cl. 95-94.00r

Keough, Timothy J.: *See—*
Jovic, Nikola L.; and Keough, Timothy J.,3,621,144.

Keough, William R., to Multifastener Company. Heat treating apparatus and method. 3,620,517, Cl. 263-6.

Kerker, William C., deceased0 (by Potdevin Machine Co.). Bag bundling machine. 3,619,976, Cl. 53-124.

Kerr, Robert E., to Westinghouse Electric Corporation. Spring flip-top mount support for mercury vapor discharge lamp. 3,621,317, Cl. 313-25.

Kerwin, William J.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,621,407.

Kesler, Sidney B., Jr.: *See—*
Singleton, Ogle R., Jr.; Kesler, Sidney B., Jr.; and Warren, William E.,3,620,516.

Kett Electric Laboratory: *See—*
Ichijo, Bunjiro, 3,621,385.

Kettler, Clarence J., to General Electric Company. Voltage regulator with zero current static switching between taps for a regulator Transformer. 3,621,374, Cl. 323-43.5

Kettler, Clarence J., to General Electric Company. Voltage regulator with zero current static switching between tapped portions of the primary of a regulator transformer. 3,621,375, Cl. 323-43.5

Kewanee Oil Company: *See—*
Willson, Karl S., 3,620,935.

Kexel, Edward P.: *See—*
Jacobson, Chester F.; and Kexel, Edward P.,3,619,996.

Keyes, Marion A., IV; Gudaz, John A.; and Tsing, Yuan-Hao, to Beloit Corporation. Fibrous stock blending control system. 3,620,915, Cl. 162-253.

Keys, Don L.: *See—*
Broderick, John P.; Wishnie, Frederick T.; and Keys, Don L.,3,620,454.

Keystone Valve Corporation: *See—*
McIver, Donald J.; and McClaid, Russell D., Jr., 3,620,575.

Khalafalla, Sanaa E.; and Payne, Sequoya L., to United States of America, Interior. Steel scrap oxidation acceleration by surface impregnation techniques. 3,620,715, Cl. 75-1.

Khlebnikov, Albert Leonidovich: *See—*
Brumberg, Rafail Mikhailovich; Trostanetsky, Leonid Moiseevich; and Khlebnikov, Albert Leonidovich,3,620,358.

Khoi, Danny James, to Cermat. Apparatus for measuring the level of liquid in a reservoir. 3,620,085, Cl. 73-439.

Kiba, William M., to Signetics Corporation. Transparent mask and method for making the same. 3,620,795, Cl. 117-5.5

Kibler, Richard W., to Firestone Tire & Rubber Company, The. Process for producing nylon tire cord. 3,621,090, Cl. 264-235.

Kidde, Walter, & Company Inc.: *See—*
Shepherd, Denis, 3,620,306.

Kienzle Uhrenfabriken GmbH: *See—*
Stechmann, Helmut, 3,621,468.

Kikuchi, Makoto; and Saeki, Toyoaki, to Toyoda Koki Kabushiki Kaisha. Automatic loading and unloading device for machine tool of the type having an extensible arm. 3,619,951, Cl. 51-103.0wh

Kikumoto, Tomichi, to Eizo Komiyama. Viewer for identification systems. 3,621,249, Cl. 250-71.

Killick, Merrill Wilfred: *See—*
Etter, Doyle Owen; and Killick, Merrill Wilfred,3,620,737.

Kilpatrick, Wallace D.: *See—*
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D.,3,621,240.

Kim, Yung Ki; and Pierce, Odgen R., to Dow Corning Corporation. Monobromo substituted fluorosilicone polymers. 3,620,992, Cl. 260-37.

Kimberly-Clark Corporation: *See—*
Burger, William H., 3,620,868.

Kindl, Bruno Milan: *See—*
Porta, Paolo della; Giorgi, Tiziano A.; Kindl, Bruno Milan; and Zucchinelli, Mario,3,620,645.

Kinert, Verlin R.: *See—*
Cosby, Ira R., 3,620,530.

King, James R.: *See—*
Haist, Grant M.; Humphlett, Wilbert J.; and King, James R.,3,620,749.

King, John O., Jr.; and Marschner, Charles F. Fasteners and method and apparatus for forming fasteners. 3,620,119, Cl. 85-1.

King, Laurence F., to Esso Research and Engineering Company. Vinyl chloride homo- and copolymers stability. 3,620,995, Cl. 260-45.85

King, Paul C., to United States of America, Navy. Rifle launched rocket. 3,620,162, Cl. 102-65.2

King Radio Corporation: *See—*
Friday, Robert E., 3,621,224.

King, Stanley T., to Dow Chemical Company, The. Infrared spectroscopy apparatus. 3,620,186, Cl.

King, William J.; and Martin, Frederick W. Method for making a buried layer semiconductor device. 3,620,851, Cl. 148-1.5

Kingston Plastics Limited: *See—*
Sutch, Brian Leo Chudleigh, 3,619,858.

Kinoshita, Masahiro: *See—*
Tanito, Keiko; Kato, Norio; Kinoshita, Shosaku; Kinoshita, Masahiro; and Sunada, Tsuyoshi,3,620,944.

Kinoshita, Shosaku: *See—*
Tanito, Keiko; Kato, Norio; Kinoshita, Shosaku; Kinoshita, Masahiro; and Sunada, Tsuyoshi,3,620,944.

Kinoshita, Tomoo: *See—*
Hirota, Ryoichi; Fujishima, Tohru; Miyazaki, Gentaro; Iwasaki, Tadahiko; Akatsu, Mitsuharu; and Kinoshita, Tomoo,3,621,123.

Kirchner: *See—*
Zieg, Wilhelm; Schmidt, Georg; Hauck, Edgar; Massell, Ingo; and Gruebel, Gustav, 3,620,115.

Kirschner, Phyllis Goldstein: *See—*
Goldstein, Paul,3,621,195.

Kissell, Gerry E.: *See—*
Finney, Robert R.; Luckenbill, Lawrence F.; and Kissell, Gerry E.,3,620,245.

Kitada, Nagayoshi; Shimazaki, Hideo; and Komata, Yasushi, to Ajinomoto Co., Inc. Method of producing a Maillard reaction product having meat-like flavor. 3,620,772, Cl. 99-140.

Kitagawa, Yoshinobu: *See—*
Washizuka, Isamu; Yoshida, Kunio; Kunikane, Akihiko; and Kitagawa, Yoshinobu,3,621,219.

Kitai, Kiyoshi, to Kabushiki Kaisha Hattori Tokeiten. Aperture controlling device in flash photography. 3,620,151, Cl. 95-64.

Kitamura, Hajime; and Shimizu, Toshihide, to Shin-Etsu Chemical Industry Co., Ltd. Chlorination of a graft polymer of a vinyl aromatic on polyvinyl chloride. 3,621,078, Cl. 260-884.

Kitamura, Hiroshi: *See—*
Miyamoto, Ryou; Hashizume, Kunio; and Kitamura, Hiroshi,3,620,662.
Yokoyama, Takeo; and Kitamura, Hiroshi,3,621,309.

Kite, Francis E.: *See—*
Germino, Felix J.; Kite, Francis E.; and Christensen, Edwin H.,3,620,842.

Klanica, Andrew J.: *See—*
Faust, John P.; Jache, Albert W.; and Klanica, Andrew J.,3,620,689.

Klasse, Fritz: *See—*
Mahler, Ernst; Becker, Erich; Czapla, Hansulrich; Klasse, Fritz; and Ehrcke, Ulrich,3,620,783.

Klawitter, Martin: *See—*
Bartel, Gunter Friedrich; Klawitter, Martin; and Denker, Ernst,3,620,680.

Klefstad Engineering Co., Inc.: *See—*
Kallas, William C., 3,619,907.
Kallas, William C., 3,619,908.

Kleiman, Jury Lvovich; Morkovin, Nikolai Viktorovich; and Kornilov, Nikolai Ilich. Sample-thermostatting device for radio-frequency spectrometers notably NMR spectrometers. 3,621,378, Cl. 324-0.5

Klein, Albert M.: *See—*
Rabow, Gerald; and Klein, Albert M.,3,621,399.

Klein, Edward I., to V-Mark Automation Ltd. Method and apparatus for adding fluid to fluid-carrying fillers. 3,620,264, Cl. 141-1.

Klein, Gerald I.: *See—*
Peterson, Noel C.; and Klein, Gerald I.,3,621,479.

Klein, Richard, to American Metal Climax, Inc. Automatic door actuator. 3,620,014, Cl. 60-51.

Klein Schanzlin & Becker Aktiengesellschaft: *See—*
Gaffal, Karl; and Sturm, Hans-Dieter, 3,620,639.

Klesper, Hugo: *See—*
Busse, Oswald; and Klesper, Hugo,3,620,233.

Kliewer, Donald L., to Telex Corporation, The. Microphone boom. 3,621,156, Cl. 179-150.

Kliment, Karel: *See—*
Stol, Miroslav; Chromecek, Richard; Stoy, Vladimir; Kliment, Karel; and Otoupalova, Jaroslava,3,620,751.

Klipping, Gustav: *See—*
Elsner, Albercht; and Klipping, Gustav,3,620,033.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Berg, Josef, 3,620,456.

Klug, Eugene D.; Spurlin, Harold M.; and Young, William L., III, to Hercules Incorporated. Reverse osmosis membranes from hydroxyalkyl derivatives of cellulose. 3,620,970, Cl. 210-23.

Klump, Dieter: *See—*
Muskat, Josef; Klump, Dieter; and Sieckmann, Jurgen,3,620,512.

Klute, Charles H.: *See—*
Reams, Robert B., Jr.; and Klute, Charles H.,3,620,623.

Knapsack Aktiengesellschaft: *See—*
Cremer, Joseph; Harnisch, Heinz; Schulte, Friedrich; and Hinz, Arnulf, 3,620,753.

Knox, Austin A., to Dict-O-Tape Inc., mesne. Low friction magnetic tape cartridge. 3,620,480, Cl. 242-199.

Knudsen, Knud, to Hewlett-Packard Company. Transistor noise measuring circuit. 3,621,394, Cl. 324-158.

Kobayashi, Akira: *See—*
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira,3,621,043.

Kobayashi, Jiro: *See—*
Watanabe, Yoshihiro; Kobayashi, Jiro; Toyoshima, Yoshiki; Tokumaru, Toor; and Saito, Masatosi,3,621,072.

Kobayashi, Makoto: *See—*
Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakajima, Jun,3,621,190.

Kobayashi, Shingo: *See—*
Nakayama, Kunihiro; Kojima, Keiichi; and Kobayashi, Shingo,3,621,178.

Kobayashi, Tatsuyoshi; and Nakamura, Isei. Process for recovering itaconic acid and salts thereof from fermented broth. 3,621,053, Cl. 260-527.

Kober, Ehrenfried H.; and Schnabel, Wilhelm J., to Olin Corporation. Process for separating ortho-isomers from tolylene diisocyanate mixtures. 3,620,929, Cl. 203-38.

Koch, Stanley H.: *See—*
Symons, Robert C.; Koch, Stanley H.; and Pierce, John B.,3,620,394.

Kochiya, Mashiro: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Mashiro; and Arima, Hideki,3,621,058.

Kochs Adlernahmaschinen Werke AG: *See—*
Junemann, Hubert, 3,620,112.

Koeber, Henry J., to Bell & Howell Company. Single knob control semi-automatic focus device. 3,620,150, Cl. 95-44.

Koechner, Walter: *See—*
Cabezas, Amado Y.; and Koechner, Walter,3,621,458.

Koenig, Karl-Heinz: *See—*
Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht,3,621,055.
Zeidler, Adolf; Koenig, Karl-Heinz; Fischer, Adolf; and Jung, Johann,3,621,017.

Koeniger, Arthur F.: *See—*
Hechenbleikner, Ingenuin; Hussar, John F.; Koeniger, Arthur F.; and Enlow, William P.,3,621,051.

Kogen, James H., to Shure Brothers Inc. Strain sensitive semiconductive thin film electro- acoustical transducer. 3,621,154, Cl. 179-110.

Kohne, Harry F., Jr.; and Kurrle, Frederick L., to Westvaco Corporation. Blushed polystyrene coating on paper. 3,620,806, Cl. 117-63.

Koishikawa, Yoshiyuki. Tambourine. 3,620,118, Cl. 84-418.

Kojima, Keiichi: *See—*
Nakayama, Kunihiro; Kojima, Keiichi; and Kobayashi, Shingo,3,621,178.

Kokusai Electric Company Limited: *See—*
Tanaka, Yukio; Mizushina, Jun; Yamagishi, Hitoshi; and Kosaki, Hiroshi, 3,621,102.

Kollesberger, Wilhelm: *See—*
Gorike, Rudolf; and Kollesberger, Wilhelm,3,621,420.

Kolster, Christel E.: *See—*
Kolster, Wilhelm K.,3,621,115.

Kolster, Wilhelm K., deceased0 (by Kolster, Christel E.; executrix), to Meridian Industries, Inc. Connector box cover construction. 3,621,115, Cl. 174-67.

Komata, Yasushi: *See—*
Kitada, Nagayoshi; Shimazaki, Hideo; and Komata, Yasushi,3,620,772.

Komatsu, Akira: *See—*
Moroe, Tatsuo; Hattori, Satohiko; Komatsu, Akira; and Yamaguchi, Yuzo,3,620,918.

Komori, Shigehiro, to Canon Camera Kabushiki Kaisha. Original holder reciprocating type driving device for photocopying machine. 3,620,620, Cl. 355-8.

Koprowski, Thomas J., to United States of America, Atomic Energy Commission. Controlled motion compensator. 3,620,583, Cl. 308-184.

Korab, George, to Atwood Vacuum Machine Company. Seat slide construction. 3,620,495, Cl. 248-430.

Korger, Heinz; and Eckel, Heinrich, to Eckel, Heinrich, Firma. Safety clamp for ski bindings employing a combined vertical and horizontal swing catch. 3,620,545, Cl. 280-11.35

Korn, Daniel J., Sr.: *See—*
Huver, Ben, 3,620,493.

Korner, Helmut. Adjustable roller worm gear arrangements. 3,620,102, Cl. 74-796.

Kornilov, Nikolai Ilich: *See—*
Kleiman, Jury Lvovich; Morkovin, Nikolai Viktorovich; and Kornilov, Nikolai Ilich,3,621,378.

Kosaki, Hiroshi: *See—*
Tanaka, Yukio; Mizushina, Jun; Yamagishi, Hitoshi; and Kosaki, Hiroshi,3,621,102.

Kosta, John A., to Technology Incorporated. Rapid photographic development system. 3,620,725, Cl. 96-22.

Koyama, Takao: *See—*
Takeuchi, Hisasuke; Sasaki, Ryoichi; Hataya, Humio; Hiraga, Ryo; Ishibashi, Eiichi; and Koyama, Takao,3,621,310.

Kozlowski, Robert H.; and Olson, Lloyd J., to Chevron Research Company. Catalytic dewaxing. 3,620,960, Cl. 208-60.

Kozu, Isao; and Ayukawa, Yukitada, to Matsushita Electric Industrial Co., Ltd. Device for detecting a tape end in a tape recorder. 3,620,429, Cl. 226-11.

Krach, Ottwin, Wolfgang Bei: *See—*
Winter, Karl-Heinz; and Krach, Ottwin, Wolfgang Bei,3,620,518.

Kramer, Arthur, to Lincoln Electric Company, The. Automatic arc welding electrode with an electrically conductive flux coating. 3,620,830, Cl. 117-204.

Krasnoff, Eugene L., to Ingersoll-Rand Company. Rock drill. 3,620,312, Cl. 173-138.

Kraus, Thaddaus; Paesold, Gerold; and Metzler, Elmar, to Balzers Patent-und Beteiligungs-AG. Electrically heatable cylindrical sample container. 3,619,839, Cl. 13-20.

Kravitz, Harvey. Device for reducing the pain of injections of medicines and other biologicals. 3,620,209, Cl. 128-41.

Krenke, Norman O.: *See—*
Elson, Ronald D.; and Krenke, Norman O.,3,620,387.

Kress, Bernard H.; and Alexander, Donald E., to Quaker Chemical Corporation. Lubricants for continuous metal casting operations. 3,620,290, Cl. 164-73.

Kreuz, Kenneth L.: *See—*
Lachowicz, Donald R.; Simmons, Todd S.; and Kreuz, Kenneth L.,3,621,050.

Kruckenberg, Winfried, to Farbenfabriken Bayer Aktiengesellschaft. Process for the dyeing of synthetic fiber materials and blends with quaternary nitrogen group containing dyestuffs. 3,620,663, Cl. 8-21.

Krueger Metal Products, Inc.: *See—*
Hendrickson, Philip J.; and Resch, Richard J., 3,620,567.

Kruger, Dietrich: *See—*
Berger, Herbert; Dold, Otto; Kruger, Dietrich; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald,3,621,016.

Kruka, Vitold R., to Shell Oil Company. Method for rapidly mixing fluids. 3,620,507, Cl. 259-25.

Krupnick, Albert C., to United States of America, National Aeronautics and Space Administration. Inorganic thermal control coatings. 3,620,791, Cl. 106-288.

Krusche, Kurt; and Zimmermann, Hubert, to Allstar Verbrauchsguter GmbH & Co., KG. Brush with rotatable base. 3,619,846, Cl. 15-172.

Kruse, Ernst Otto. Press molding machine with adjustable feed device. 3,620,293, Cl. 164-154.

Krutein, Manfred G. Sea mining vessel. 3,620,572, Cl. 299-8.

Kubo, Kazuo: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Mashiro; and Arima, Hideki,3,621,058.

Kubo, Keishi; and Sakai, Kiyoshi, to Kabushiki Kaisha Ricoh. Heat-sensitive stencil paper. 3,620,160, Cl. 101-128.2

Kubo, Moritada; Takahashi, Yukiharu; and Miles, T. William, to Tokyo Shibaura Electric Co., Ltd. Apparatus processing pulse numbers for use in a PID digital control system. 3,621,357, Cl. 318-600.

Kubokawa, Masaharu. Pliers for stop rings. 3,619,890, Cl. 29-229.

Kuessner, Albrecht: *See—*
Wicke, Ewald; and Kuessner, Albrecht,3,620,844.

Kuhn, Karl-Ernst; Kuschmierz, Heinz; and Staudt, Heinrich, to Bosch, Robert, G.m.b.H. Centrifugal governor for the RPM control of internal combustion engines. 3,620,199, Cl. 123-140.

Kulbersh, Irwin R.: *See—*
Ferdinand, Irwin J.; and Kulbersh, Irwin R.,3,620,176.
Ferdinand, Irwin J.; and Kulbersh, Irwin R.,3,620,588.

Kulp, Robert C., to Frank, Alan I. W., Corporation, The. Cup and lid. 3,620,437, Cl. 229-43.

Kulwicki, Henry E., to Harris Intertype Corporation. Folder-gluer and auxiliary conveyors therefor. 3,620,139, Cl. 93-50.

Kund, August: *See—*
Bivans, Elbert L.; and Kund, August,3,620,386.

Kunik, Jordan, I.: *See—*
Graham, George C., 3,619,978.

Kunikane, Akihiko: *See—*
Washizuka, Isamu; Yoshida, Kunio; Kunikane, Akihiko; and Kitagawa, Yoshinobu,3,621,219.

Kuntz, William K.; and Souviner, George E., to United States of America, Navy. Connector assembly for disposable bomb arming device. 3,620,122, Cl. 89-1.5

Kupcikevicius, Vytautas, to Union Carbide Corporation. Apparatus for expelling air from a bagged product. 3,619,974, Cl. 53-79.

Kuraray Co., Ltd.: *See—*
Sogi, Hidenobu, 3,620,435.

Kurashiki Rayon Co., Ltd.: *See—*
Tanimoto, Katsukiyo; Urakami, Tamio; and Itadani, Sotaro, 3,620,897.

Kurrle, Frederick L.: *See—*
Kohne, Harry F., Jr.; and Kurrle, Frederick L.,3,620,806.

Kursinczky, William, to General Cable Corporation. Micro adjusting guide. 3,620,063, Cl. 72-250.

Kursinczky, William, to General Cable Corporation. Magazine feed storage conveyor. 3,620,348, Cl. 198-75.

Kurtz, Jay,: *See—*
Fonda-Bonardi, Giusto, 3,620,017.

Kuschmierz, Heinz: *See—*
Kuhn, Karl-Ernst; Kuschmierz, Heinz; and Staudt, Heinrich,3,620,199.

Kushner, Benjamin H.: *See—*
Jureit, John C.; Csakvary, Oscar; Castillo, Adolfo; Kushner, Benjamin H.; and Karch, Otto J.,3,620,270.

Kuwabara, Tsutomu: *See—*
Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio,3,621,087.

Kuwahara, Kazuo: *See—*
Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi,3,620,227.

Kuwajima, Hideki, to Riccar Swing Machine Co., Ltd. Single thread chain stitch forming means for use in a conventional sewing machine. 3,620,179, Cl. 112-168.

Kwan, Chio. Photocell control circuit for motor operated toy. 3,621,356, Cl. 318-480.

Kwok, Russell; and Pohland, Albert, to Eli Lilly and Company. Chromans. 3,621,041, Cl. 260-345.2

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Abe, Shigeo; Furuya, Akira; and Okachi, Ryo, 3,620,921.
Abe, Shigeo; and Furuya, Akira, 3,620,922.
Mochizuki, Kazuo; Otsuka, Hiroyasu; Katumata, Hideo; Oka, Tetuo; and Tanaka, Masao, 3,620,925.

Laa, Friedrich: *See—*
Vermeijlen, Leopold Petrus Johannes; and Laa, Friedrich,3,620,385.

Laboureur, Pierre; Brunaud, Marcel D. P.; and Langlois, Claude, to Societe d'Etudes et d'Applications Biochimiques, and Etablissements Clin-Byla Paris: Ugine-Kuhlmann. Urate oxidase and process for the production thereof. 3,620,923, Cl. 195-66.

Lachowicz, Donald R.; Simmons, Todd S.; and Kreuz, Kenneth L., to Texaco Inc. Method for producing a peroxy nitrate. 3,621,050, Cl. 260-466.

La Detection Electronique Francaise: *See—*
Lecuyer, Daniel, 3,621,262.

Lagonegro, Paul R.: *See—*
Davidson, James R.; and Lagonegro, Paul R.,3,620,616.

Lai, Stanley H.: *See—*
Liebermann, Leonard N.; and Lai, Stanley H.,3,621,392.
Laimins, Eric; and Lockery, Harry E., to BLH Electronics, Inc. Shear-type transducers compensated for effects of non-uniform bending. 3,620,074, Cl. 73-141.
L'Air Liquide Societe Anonyme Pour l-Etude et l Exploitation des Procedes Georges Claude:*See—*
Simonet, Guy, 3,620,032.
L'Air Liquide, Societe Anonyme pour l'Etude & l'Exploitation des Procedes Georges Claude:*See—*
Domine, Daniel; and Hay, Leon, 3,619,984.
Lakodey, Andre; Mathais, Henri; and Weiss, Francis, to Ugine Kuhlmann. Process for preparing substituted lactones. 3,621,035, Cl. 260-343.
Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Rotary piston injection-type internal combustion engine. 3,620,195, Cl. 123-8.13
Lancini, Giancarlo; and Sensi, Piero, to Lepetit S.p.A. Process for the manufacture of physiologically active compounds. 3,620,920, Cl. 195-28.
Land, Edwin H., to Polaroid Corporation. Photographic color diffusion transfer processes and elements for use therein. 3,620,724, Cl. 96-3.
Landhult, Hans: *See—*
Dalmo, Bror; Franked, John; Landhult, Hans; Nordberg, Birger; Ronnevig, Carl; and Tjernstrom, Ove,3,621,315.
Lane, James W.: *See—*
Dimeff, John; and Lane, James W.,3,620,083.
Lange, Alfonso. Portable chain saw with antivibration handle. 3,620,269, Cl. 143-32.
Lange Company, The: *See—*
Hanson, Chris A.; and Hanson, Alden B., 3,619,914.
Langen & Company: *See—*
Hovorka, Reiner, 3,620,542.
Langlois, Claude: *See—*
Laboureur, Pierre; Brunaud, Marcel D. P.; and Langlois, Claude,3,620,923.
Lanier, Maceo M.; and Williams, Nathan P., to United States of America, Army. Moisture-proof wire holder. 3,620,539, Cl. 277-63.
Lanner, Arthur W., to Procter & Gamble Company, The. Textile lubricant useful in aminoplast modification processes. 3,620,665, Cl. 8-115.6
La Pan, Gary Eugene: *See—*
Jones, Morris C., Jr.; and La Pan, Gary Eugene,3,620,355.
Larka, Vincent E.: *See—*
Cluett, Ronald D.; and Larka, Vincent E.,3,621,284.
Larkin, Robert F.Child's swing. 3,620,531, Cl. 272-89.
Larkin, William A.; and Treadwell, Kenneth, to M&T Chemicals Inc. Urethane foam catalyst and process for preparing urethane foam. 3,620,985, Cl. 260-2.5
Larko, Robert C.: *See—*
Ross, Robert H.; Larko, Robert C.; and Swartzfager, Walter G.,3,620,520.
La Rocco, Samuel S.; and Ventre, Daniel B. Panoramic camera. 3,620,148, Cl. 95-15.
Larson, Earl G.: *See—*
Martin, James S.; Leek, Wayne E.; Pierce, Perry J., Jr.; and Larson, Earl G.,3,619,925.
La Societe Constructions Metalliques de Provence: *See—*
Chambonnet, Andre Alphonse, 3,621,183.
La Societe Financiere Pour la Recherche et l'Industrie:*See—*
Normos, Norbert, 3,620,420.
Latash, Jury Vadimovich: *See—*
Medovar, Boris Izrailevich; Baglia, Vitaly Mikhailovich; Sevruk, Albert Nikolaevich; and Latash, Jury Vadimovich,3,620,287.
Lathrop, Francis M.: *See—*
Van Arsdale, Lyle R.; Lathrop, Francis M.; and Reaves, Vernon R.,3,620,236.
Latour, Claude, to Societe A. Responsabilite Limitee Societ d' Etudes et de Developpement Industriel Proclem. Power transmitting system. 3,620,044, Cl. 64-14.
Lau, Edward L. Golf course. 3,620,536, Cl. 273-176.
Laucournet, Robert: *See—*
Guigan, Jean; and Laucournet, Robert,3,620,678.
Laufe, Leonard E.: *See—*
Fannon, Robert D., Jr.; Lower, Brenton R.; and Laufe, Leonard E.,3,620,212.
Laurent, Jacques, to Application Des Gaz. Lighting devices for gas burners. 3,620,660, Cl. 431-255.
Lawrence, Walter P., to U.S. Plywood-Champion Papers, Inc. Process for the preparation of groundwood pulp from a dicotyledonous plant. 3,620,910, Cl. 162-83.
Lawrie, Brian Wilfred, to Rolls Royce Limited. Gas turbine engines. 3,620,021, Cl. 60-226.
Lawson, Richard L., to Rockwell Manufacturing Company. Automatic lubrication for valve stem threads. 3,620,502, Cl. 251-355.
Lawton, Peter A. Fastener driving tool. 3,620,433, Cl. 227-10.
Lea, Hans, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Apparatus for filling dental mold flasks. 3,620,508, Cl. 259-72.
Leach Corporation: *See—*
Adams, Andrew O.; and Capol, Roman J., 3,621,419.
Lear Siegler, Inc.: *See—*
Miller, Justin G., 3,620,488.
Leary, David E.: *See—*
Janetos, Nicholas S.; Marzocchi, Alfred; and Leary, David E.,3,620,701.
Leathen, William W., to Gulf Research & Development Company. Cultivation of micro-organisms on hydrocarbons. 3,620,927, Cl. 195-82.
Leathers, John William: *See—*
Davis, John Christopher Hammond; and Leathers, John William,3,620,087.
Leclanche S.A.: *See—*
Schnegg, Kurt, 3,621,359.
Leconte, Jacky, to Regie Nationale des Usines Renault, and Automobiles Peugeot. Door arm-rests of automotive vehicles. 3,620,566, Cl. 296-153.
Lecuyer, Daniel, to La Detection Electronique Francaise. Alarm device gas discharge tube. 3,621,262, Cl. 250-214.
Lee, Max Nai Yuen: *See—*
Turnock, Philip Hain; Lee, Max Nai Yuen; and Manchsnda, Krisham Dayal,3,620,969.
Lee, Sung C.: *See—*
Burns, Edward P.; and Lee, Sung C.,3,621,334.
Leeds & Northrup Company: *See—*
Eckfeldt, Edgar L., 3,621,381.
Leeds, Harry R., to Patent Structures, Inc. Graft of hydroxyalkyl methacrylate onto polyvinylpyrrolidone. 3,621,079, Cl. 260-885.
Leedy, Hayden M., Jr.: *See—*
Portnoy, William M.; and Leedy, Hayden M., Jr.,3,621,344.
Leek, Wayne E.: *See—*
Martin, James S.; Leek, Wayne E.; Pierce, Perry J., Jr.; and Larson, Earl G.,3,619,925.
Leff, Jerry; and Roberts, Arthur A., to International Business Machines Corporation. Reliability of aluminum and aluminum alloy lands. 3,620,837, Cl. 117-217.
Lehmann, Ernst Paul: *See—*
Richter, Wolfgang, 3,620,451.
Lemelson, Jerome H. Apparatus and method for producing composite materials. 3,620,880, Cl. 156-384.
Leming, Paul W.; and Flanigan, Richard J., to Universal American Corporation. Machine for surfacing brake discs. 3,619,952, Cl. 51-117.
Lennox, Colin G.: *See—*
Hilborn, John W.; Lennox, Colin G.; and Mathers, Wilson G.,3,620,916.
Lentz, Morgan E.: *See—*
Kaye, J. Arthur; and Lentz, Morgan E.,3,620,638.
Lenz, Robert W.; Barish, Leo; and Lyons, Virginia L., to Allied Chemical Corporation. Process for chemically texturing polyester fibers. 3,620,666, Cl. 8-130.1
Leonard, Louis H., Jr.; and Bell, William W., Jr., to Carrier Corporation. Solution concentration control in absorption refrigeration systems. 3,620,036, Cl. 62-101.
Lepetit S.p.A.: *See—*
Lancini, Giancarlo; and Sensi, Piero, 3,620,920.
Lesney Products & Co., Limited: *See—*
Goodbody, James, 3,619,943.
Letter, Eugene C., to Bausch & Lomb Incorporated. Method of making an electro-chemical storage cell. 3,620,866, Cl. 156-102.
Leuenberger, Paul. Electrically heated central hot water heating system. 3,620,450, Cl. 237-8.
Lewinson, Lothar J., to Admiral Corporation. Color television picture tube with metallic film coating PN funnel portion. 3,621,318, Cl. 313-64.
Li, Hsin Lang; Prevorsek, Dusan C.; and Oswald, Hendrikus Johan, to Allied Chemical Corporation. Travelling-edge crimper and process. 3,619,874, Cl. 28-1.5
Liang, Charles C.: *See—*
Epstein, James; and Liang, Charles C.,3,620,848.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Renner, Otto, 3,620,190.
Lide, Basil M., to Westinghouse Electric Corporation. X-ray tire inspection apparatus. 3,621,247, Cl. 250-52.
Liebermann, Leonard N.; and Lai, Stanley H., to Thermal Industries of Florida, Inc. Connectionless electrical meter for measuring voltage or power factor. 3,621,392, Cl. 324-142.
Lien, Donald R.: *See—*
Iceland, William F.; and Lien, Donald R.,3,621,185.
Lif-O-Gen, Inc.: *See—*
Stropie, Gordon N.; and Mills, Justin W., Jr., 3,620,265.
Lim, James. Method and device for increasing the voltage of D.C. electricity. 3,621,377, Cl. 323-93.
Linahan, James,: *See—*
Fonda-Bonardi, Giusto, 3,620,017.
Lincoln Electric Company, The: *See—*
Kramer, Arthur, 3,620,830.
Lindberg, Victor L., to Ford Motor Company. Lens with facets for projecting light along different axes. 3,620,600, Cl. 350-167.
Lindenthal, Hans: *See—*
Aramasow, Waldemar; Muller, Helmut; and Lindenthal, Hans,3,620,319.
Lindstrom, Oscar F. Air impulse electrical switch with alternate action. 3,621,166, Cl. 200-81.9
Lineberger, Robert O.; Wiberley, James S.; and Griffin, Joseph R., to Beaunit Corporation. Selvage finish compositions and the treatment of resin treated cellulosic fabrics therewith. 3,620,803, Cl. 117-44.

Lingnau, Josef: *See—*
Hohn, Gerhard; and Lingnau, Josef,3,620,449.
Link, Donald A.; Hubertus, Wash; and Williams, Fred H., to Cutler-Hammer, Inc. Toggle linkage contact operating mechanism for electric circuit breaker. 3,621,189, Cl. 200-153.
Linnman, Sven N. J.; and Udden, Per E. C. Arrangement for pre-magnetizing a static DC converter. 3,621,363, Cl. 321-2.
Linotype G.m.b.H.: *See—*
Debus, Karl, 3,620,360.
Lipinski, John M.: *See—*
Stump, Paul W.; Huber, James A.; and Lipinski, John M.,3,620,869.
Lipton, Morris A.: *See—*
Prange, Arthur J., Jr.; Wilson, Ian C.; and Lipton, Morris A.,3,621,096.
Lisowski, Frank B.: *See—*
Lisowski, John A.; and Lisowski, Frank B.,3,620,937.
Lisowski, John A.; and Lisowski, Frank B., to Natural Products Company. Method and electrolyte for electroplating brass. 3,620,937, Cl. 204-44.
Litton Industries, Inc.: *See—*
Price, Ralph E., 3,619,950.
Litzinger, Gerald E.: *See—*
Wyatt, Jethro T.; and Litzinger, Gerald E.,3,620,465.
Lizotte, Albert R., Sr.; Vidal, Jorge Argemi; and Mackenzie, Albert H. Baby crib rocker Lightweight detachable tent-cot means. 3,619,826, Cl. 5-113.
LKB Medical AB: *See—*
Tysk, Jan Erik; Olofsson, Sven Skalby; and Jacobson, Nils Bertil, 3,620,215.
Lockery, Harry E.: *See—*
Laimins, Eric; and Lockery, Harry E.,3,620,074.
Loev, Bernard: *See—*
Yu-Wen Jen, Timothy; and Loev, Bernard,3,621,025.
Lofgren, Stig-Gunnar: *See—*
Eriksson, Erik Helmer; Hogberg, Lars-Gunnar; Kempe, Carl Peter Seth; and Lofgren, Stig-Gunnar,3,620,272.
Logie, Frank Mc Lean: *See—*
Banasiewicz, Henryk; and Logie, Frank Mc Lean,3,621,474.
Lohmann, Harald; and Diener, Horst, to Kalle Aktiengesellschaft. Extrusion-coated, biaxially oriented polypropylene film having improved adhesion characteristics. 3,620,825, Cl. 117-138.8
Lombardi, Eugene H., to Ethyl Corporation. Control apparatus. 3,621,341, Cl. 317-157.
Lombardo, Michael S.: *See—*
Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S.,3,620,933.
Longcore, Lawrence A., to Arco Industries Corporation. Gas scrubber with tangential water introduction. 3,620,510, Cl. 261-79.
Longsworth, Ralph C., to Air Products and Chemicals, Inc. Refrigeration method and apparatus. 3,620,029, Cl. 62-6.
Loop, Russell W.; Tongier, Max, Jr.; and Cone, Clarence D., Jr., to United States of America, National Aeronautics and Space Administration. Absolute focus lock for microscopes. 3,620,595, Cl. 350-86.
Loots, Gilliam. Gate arrangement. 3,619,945, Cl. 49-30.
Lorain Products Corporation: *See—*
Chambers, Charles William, Jr., 3,621,143.
Lorenz, Roman R.: *See—*
Archer, Sydney; and Lorenz, Roman R.,3,621,062.
Lower, Brenton R.: *See—*
Fannon, Robert D., Jr.; Lower, Brenton R.; and Laufe, Leonard E.,3,620,212.
Loyer, Lavern L. Method of and apparatus for removing stumps. 3,620,271, Cl. 144-2.
Lubrastart International: *See—*
Grigsby, Gilbert R., 3,620,424.
Lucas, Joseph, (Industries) Limited: *See—*
Heap, Alec John, 3,621,159.
Lumby, Roland John, 3,619,861.
Wiley, David; and Allport, Maurice James, 3,621,360.
Lucius & Bruning: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,621,057.
Luckenbill, Lawrence F.: *See—*
Finney, Robert R.; Luckenbill, Lawrence F.; and Kissell, Gerry E.,3,620,245.
Ludeman, Clifford G.: *See—*
Reynolds, Blake; and Ludeman, Clifford G.,3,620,699.
Luders, Walter: *See—*
Steppan, Hartmut; Messwarb, Gunter; and Luders, Walter,3,620,733.
Luhleich, Hartmut: *See—*
Drittler, Karl; and Luhleich, Hartmut,3,620,835.
Lumby, Roland John, to Lucas, Joseph, (Industries) Limited. Die and punch sets. 3,619,861, Cl. 18-16.
Lund, Alvin R., to Markstone Manufacturing Company. Recessed lighting fixture including mounting clamp means. 3,620,401, Cl. 220-3.6
Lundberg, Thorsten Ingvar Egon, to Aktiebolaget Gotaverken. Machine for flame cutting of identical components from a stack of plates. 3,620,521, Cl. 266-23.
Lundgren, Karl Ivar, to Atlas Copco Aktiebolag. Chuck control for dental drills and the like. 3,619,904, Cl. 32-26.
Lupton Bros. Ltd.: *See—*
Bulcock, Colin L., 3,620,261.
Lyles, James M., to Xerox Corporation. Biased input chute. 3,620,191, Cl. 118-637.
Lynch, Thomas L.: *See—*
Anderson, Karl F.; and Lynch, Thomas L.,3,621,285.
Lynch, William C., to Jackson Manufacturing Co. Wheelbarrow parts packaging. 3,620,364, Cl. 206-46.
Lyons, Virginia L.: *See—*
Lenz, Robert W.; Barish, Leo; and Lyons, Virginia L.,3,620,666.
Ma, Stephen P. F., to Hughes Aircraft Company. MOSFET asynchronous dynamic binary counter. 3,621,280, Cl. 307-225.
Maastricht, Charles R., to Giddings & Lewis, Inc. Preload spindle bearing for machine tool. 3,620,586, Cl. 308-207.
M.A.B. Machine Corporation, The: *See—*
Bourquin, Maurice A., 3,620,332.
Mac Dermid Incorporated: *See—*
Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S., 3,620,933.
MacGuire-Cooper, Richard Terence, to Oxford Aerosoles Limited. Valves for pressurized liquid containers. 3,620,421, Cl. 222-402.21
Machell, Greville, to Deering Milliken Research Corporation. Process for improving soiling characteristics of hydrophobic textile material. 3,620,826, Cl. 117-139.5
Mack, Charles H.: *See—*
Hobart, Stanley R.; McGregor, Howard H., Jr.; and Mack, Charles H.,3,620,664.
Mack, Donald E., to Xerox Corporation. Dicode decoder. 3,621,141, Cl. 178-88.
Mackenzie, Albert H.: *See—*
Lizotte, Albert R., Sr.; Vidal, Jorge Argemi; and Mackenzie, Albert H.,3,619,826.
MacLean-Fogg Lock Nut Co.: *See—*
Hlinsky, Emil J.; and Siblik, Allen D., 3,621,236.
Mac Millan, Daniel G. Joint locking apparatus. 3,620,558, Cl. 287-54.
Macy, James C., to Thrust, Incorporated. Magnetic actuator. 3,621,422, Cl. 335-264.
Maddox, V Harold, to Parke, Davis & Company. Food capsule. 3,620,759, Cl. 99-78.
Mading, James E., to Cutler-Hammer, Inc. Bolt-on strain gage transducer structure. 3,621,437, Cl. 338-5.
Maeda, Haruo, to Matsushita Electric Industrial Co., Ltd. Secondary electron multiplier consisting of single sawtooth multiplying surface. 3,621,320, Cl. 313-105.
Maeda, Riichi; and Mori, Yoichi, to Nissan Motor Company, Limited. Electro-mechanical power train system for an automotive vehicle. 3,620,323, Cl. 180-65.
Maffei, Jack D., to Maffei, L. D., Seed Company. Harvesting machine. 3,619,993, Cl. 56-12.4
Maffei, L. D., Seed Company: *See—*
Maffei, Jack D., 3,619,993.
Magnavox Company, The: *See—*
Crane, Paul J.; and Reese, Glenn A., 3,621,201.
Seiy, Merle E., 3,621,403.
Waring, Richard J., 3,621,134.
Magoon, Eugene F.; Cannell, Lawrence G.; and Raley, John H., to Shell Oil Company. Heterogeneous catalyst compositions. 3,620,981, Cl. 252-429.
Mahler, Ernst; Becker, Erich; Czapla, Hansulrich; Klasse, Fritz; and Ehrcke, Ulrich, to Didier-Werke A.G. Silica refractory material. 3,620,783, Cl. 106-69.
Maierson, Theodore, to National Cash Register Company, The. Method, articles and compositions of matter containing large capsules. 3,619,842, Cl. 15-104.93
Maistre, Michel Antoine Jules. Lightweight cellular structure. 3,620,870, Cl. 156-197.
Mallard, J T. Pile driving method and apparatus. 3,620,026, Cl. 61-46.5
Mallory, P. R., & Co., Inc.: *See—*
Epstein, James; and Liang, Charles C., 3,620,848.
Manber, Solomon, to Alphanumeric, Incorporated. Widespan pattern generator. 3,621,137, Cl. 178-15.
Manchsnda, Krisham Dayal: *See—*
Turnock, Philip Hain; Lee, Max Nai Yuen; and Manchsnda, Krisham Dayal,3,620,969.
Manco Manufacturing Co.: *See—*
Valente, Raymond L., 3,621,176.
Manger, Charles Walter: *See—*
Chu, Victor Fu-Hua; and Manger, Charles Walter,3,620,726.
Mann, Joyce, 1/2 to Mann, Lance L. Mammary prosthesis. 3,619,819, Cl. 3-36.
Mann, Lance L.: *See—*
Mann, Joyce, 3,619,819.
Manning, Robert E.: *See—*
Houlihan, William J.; and Manning, Robert E.,3,621,056.
Mano, Morimasa, to Brother Kogyo Kabushiki Kaisha. Printing device for a calculating machine. 3,620,446, Cl. 235-60.15
Mans, Leonardus Frans Helene: *See—*
Geominy, Louis Joseph Henri; Gommans, Hubertus Johannes Josephus; Mans, Leonardus Frans Helene; and Ruytenbeek, Silvester Marie,3,621,203.
Mansson, Harry, to Nippon Kokan Kabushiki Kaisha and Rederiaktiebolaget Helsingborg. Collapsible pallet with pivoted end supports. 3,620,388, Cl. 214-10.5
Marathon Electric Research of Canada, Ltd.: *See—*
Duff, David L.; and Dewan, Shashi B., 3,621,366.

Marathon Oil Company: *See—*
Parsons, Robert W., 3,620,302.
Marchant, John C.; and Motter, Robert F., to Eastman Kodak Company. Photographic element including super-imposed silver halide layers of different speeds. 3,620,747, Cl. 96-74.
Marchello, John L. Helmet chin strap. 3,619,813, Cl. 2-3.
Marconi Company Limited, The: *See—*
Hipwell, William Ernest Henry, 3,621,122.
Marculewicz, Robert W.: *See—*
Rachwal, Ervin J.; Marculewicz, Robert W.; and Campbell, Douglas B.,3,620,621.
Marhanka, Frank D. Pocker size reference index. 3,619,921, Cl. 40-95.
Markow, Edward G., to United States of America, Army, mesne. Hybrid pneumatic-mechanical variable configuration wheel. 3,620,278, Cl. 152-9.
Markstone Manufacturing Company: *See—*
Lund, Alvin R., 3,620,401.
Marquis, Theodore M.; and Crabb, John A., said Crabb assor. to said Marquis. Automatic carton stapling machine. 3,620,434, Cl. 227-101.
Marschner, Charles F.: *See—*
King, John O., Jr.; and Marschner, Charles F.,3,620,119.
Martel, Bob E.: *See—*
Baker, Charles E.; and Martel, Bob E.,3,621,133.
Martensson, Kjell Halvard; and Karlsson, Lars Anders, to AB Tetra Pak. Packaging machine. 3,619,979, Cl. 53-186.
Marthaler, Max: *See—*
Schellenberg, Matthias; and Marthaler, Max,3,620,744.
Martin, Carl, 50% to Ray, Kay M., Mrs. Method for the continuous hot galvanizing of continuously formed elements. 3,620,805, Cl. 117-51.
Martin, Frederick W.: *See—*
King, William J.; and Martin, Frederick W.,3,620,851.
Martin, Gregory L.: *See—*
Blair, Lloyd R.; and Martin, Gregory L.,3,621,450.
Martin, James S.; Leek, Wayne E.; Pierce, Perry J., Jr.; and Larson, Earl G., to Remington Arms Company, Inc. Adjustable skeet weight for firearms. 3,619,925, Cl. 42-901.
Martin, James S.; and Morse, Charles H., to Remington Arms Company, Inc. Ejector system capable of ejecting shells of different lengths. 3,619,928, Cl. 42-25.
Martin Marietta Corporation: *See—*
Friedell, Morley V., 3,620,501.
Sullivan, Herbert L., 3,620,634.
Martin, Raymond Alfred: *See—*
Daker, Horace Herbert; Martin, Raymond Alfred; and Rose, John,3,620,001.
Martin, Robert L.: *See—*
Ariyan, Zaven S.; and Martin, Robert L.,3,621,032.
Martindale, Allan; Parr, Bryan R.; and Smith, Michael J. S., to Simon-Carves Limited. Helical flow crystallizer in a desalination unit. 3,620,035, Cl. 62-101.
Marty, Michel E.: *See—*
Galmiche, Philippe; Hivert, Andre R.; and Marty, Michel E.,3,620,720.
Marvel, Carl S., to Research Corporation, mesne. Quinoxaline-anthraquinone polymers. 3,620,997, Cl. 260-50.
Marvel, Carl S., to Research Corporation, mesne. Anthraquinone-bisbenzazole polymers. 3,620,999, Cl. 260-65.
Marz, Frank H., to Bunker-Ramo Corporation, The. Time indicating device of direct read-off type. 3,620,004, Cl. 58-23.
Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Multifilament reinforcement yarns and articles containing same. 3,620,280, Cl. 152-359.
Marzocchi, Alfred: *See—*
Janetos, Nicholas S.; Marzocchi, Alfred; and Leary, David E.,3,620,701.
Maschinenfabrik Hennecke GmbH: *See—*
Schmitzer, Willi, 3,620,188.
Maschinenfabrik Koppern & Co. K.G.: *See—*
Rieschel, Hartmut, 3,620,157.
Maschinenfabrik Turner A.G.: *See—*
Skocir, Rudolf, 3,620,528.
Massell, Ingo: *See—*
Zieg, Wilhelm; Schmidt, Georg; Hauck, Edgar; Massell, Ingo; and Gruebel, Gustav,3,620,115.
Massey-Ferguson Inc.: *See—*
Richey, Clarence B., 3,620,310.
Massey-Ferguson Services N.V.: *See—*
Bailey, Alfred J., 3,620,419.
Masterman, John Michael, to Dowty Rotol Limited. Time integral control system. 3,621,350, Cl. 318-171.
Mastriforte, Otil F.: *See—*
Sobanski, Stanley J.; Mastriforte, Otil F.; and Noell, Godwin L.,3,619,882.
Matchett, Joseph J.: *See—*
Cox, Paul D.; and Matchett, Joseph J.,3,620,574.
Mathais, Henri: *See—*
Lakodey, Andre; Mathais, Henri; and Weiss, Francis,3,621,035.
Mathers, Wilson G.: *See—*
Hilborn, John W.; Lennox, Colin G.; and Mathers, Wilson G.,3,620,916.
Mathis, Earl. Seat safety harness. 3,620,569, Cl. 297-388.
Mathisen, Henry A.: *See—*
Gunto, Robert L.; and Mathisen, Henry A.,3,620,614.
Matley, Joseph Brian, to Ampex Corporation. Phase lock, speed control system. 3,621,353, Cl. 318-314.
Matrographics, Inc.: *See—*
Rachwal, Ervin J.; Marculewicz, Robert W.; and Campbell, Douglas B., 3,620,621.
Matsudo, Yoryo: *See—*
Goto, Tatsuo; Matsudo, Yoryo; and Watanabe, Hiroshi,3,621,351.
Matsuka, Keisuke: *See—*
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira,3,621,043.
Matsummura, Shigeru; Asano, Nobuyuki; and Kawaguchi, Munetaka, to Sumitomo Electric Industries Ltd. Polyester-amide-imide insulating varnish and method of preparation. 3,620,996, Cl. 260-47.
Matsumoto, Seiji: *See—*
Honjo, Satoru; Tamai, Yasuo; Sato, Masamichi; and Matsumoto, Seiji,3,620,798.
Matsuo, Tatsuro. Precipitating silver halide in 0.5 to 3 percent weight aqueous gelatin solution. 3,620,752, Cl. 96-114.7
Matsushita Electric Industrial Co., Ltd.: *See—*
Kozu, Isao; and Ayukawa, Yukitada, 3,620,429.
Maeda, Haruo, 3,621,320.
Segawa, Kazutoshi, 3,621,409.
Matsushita Electric Industrial Company, Limited: *See—*
Yoshimura, Susumu; Hasegawa, Katsue; Yamamoto, Yoshio; and Tajima, Iwao, 3,621,342.
Matsuura, Hirotsugu. Rotary spare blade safety razor. 3,619,900, Cl. 30-40.
Mattel, Inc.: *See—*
Mercer, Francis T.; and Petersen, Frederick A., Jr., 3,620,538.
Thompson, Norman C.; and Merino, Dennis H., 3,619,937.
Matvey, Joseph J. Vegetation inhibiting guard. 3,619,944, Cl. 47-33.
Maurel, Pierre; and Duhart, Pierre, to Compagnie Pechiney. Process for the acid treatment of aluminous ores for the recovery of alumina. 3,620,671, Cl. 23-143.
Maw, Philip A., to Molins Machine Company Limited. Continuous rod making machines such as cigarette machines. 3,620,092, Cl. 74-230.23
Max-Planck-Gesellschaft zur Forderung der Wissenschaften ev: *See—*
Elsner, Albercht; and Klipping, Gustav, 3,620,033.
Maxwell, James D. Weight release mechanism. 3,619,932, Cl. 43-43.12
May & Baker Limited: *See—*
Bujwid, Zdzislaw Jan; and Hodgson, John Francis, 3,621,042.
Mayron, David; and Tiano, Frank J., to Smith Kline & French Laboratories. Concentrated aqueous liquid antacid compositions containing certain phosphate and gluconate salts. 3,621,094, Cl. 424-128.
MCA Technology, Inc.: *See—*
Johnson, Keith O., 3,621,148.
McCaughey, Stuart H. Horizontal high speed transfer. 3,620,381, Cl. 214-1.
McCauley, Don O.: *See—*
Horsey, William C.; Samson, Robert H.; and McCauley, Don O.,3,621,246.
McClaid, Russell D., Jr.: *See—*
McIver, Donald J.; and McClaid, Russell D., Jr.,3,620,575.
McCombie, Alan K., to Molins Machine Company Limited. Article-handling apparatus. 3,620,349, Cl. 198-78.
McCoy, Frederic C., to Texaco Inc. Thickened compositions and process of preparing them. 3,620,695, Cl. 44-7.
McCulloch Corporation: *See—*
Hazzard, Harry I., 3,619,865.
Mc Donald's System, Inc.:*See—*
Schindler, James C.; Weimer, Ralph E.; and Herbert, Ronald M., 3,620,156.
McDonnell Douglas Corporation: *See—*
Foster, Milton E.; and Gogin, Dimitri A., 3,620,353.
Somerville, Robert H.; and Bakker, Lewis P., 3,620,298.
McDonnell, Gerald F.; and Freebairn, Hugh T., to Banana Control, Inc. Method and apparatus for ripening fruit and the like. 3,620,765, Cl. 99-103.
McDonough, Cletus: *See—*
Horecky, Stanley V.; and McDonough, Cletus,3,621,445.
McDowell-Wellman Engineering Company: *See—*
Cheek, Edward E., 3,620,350.
McFadyen, Robert J.: *See—*
Fawcett, James W.; Irwin, John M.; and McFadyen, Robert J.,3,621,354.
McGrath, Brian Patrick; and Williams, Keith Vaughan, to British Petroleum Company, The. Process for producing 2-methyl-butene-2 from butene streams. 3,621,073, Cl. 260-683.
McGrath, Martin H., to General Cable Corporation. Field impregnated extra high voltage cable system. 3,621,110, Cl. 174-25.
McGraw Edison Company: *See—*
Fremont, Robert S., 3,621,234.
McGraw-Edison Company: *See—*
Schwab, Pierre P., 3,621,157.
McGregor, Howard H., Jr.: *See—*
Hobart, Stanley R.; McGregor, Howard H., Jr.; and Mack, Charles H.,3,620,664.
McIver, Donald J.; and McClaid, Russell D., Jr., to Keystone Valve Corporation. Particulate conveying apparatus. 3,620,575, Cl. 302-53.
McKay, Lester M. Method for removing pollutants from the atmosphere. 3,619,980, Cl. 55-84.

McKeon, James E.: *See—*
Starcher, Paul S.; Trecker, David; and McKeon, James E.,3,621,012.

Mc Kinnon, Richard E., to Specialized Products, Inc. Apparatus for spreading particulate material. 3,620,390, Cl. 214-17.

McLarty, Gordon. Universal fan mount and fan. 3,620,644, Cl. 416-247.

McLaughlin, Alexander M.; and Rose, James S., to Upjohn Company, The. Preparation of polymer foam. 3,620,987, Cl. 260-2.5

Mc Laughlin, William M. Tool for forcibly removing a cylinder from a lock. 3,619,887, Cl. 29-267.

Mc Marlin, Robert M., to Owens-Corning Fiberglas Corporation. Glass composition. 3,620,787, Cl. 106-50.

Mc Millan, Jerry N. Machine for pressing smock-type garments. 3,619,919, Cl. 38-61.

McMillan, Jerry N. Garment removal apparatus. 3,620,354, Cl. 198-177.

McNally, Robert N.; and Patrick, Robert F., to Corhart Refractories Company. Manufacture of fused cast basic refractory. 3,620,782, Cl. 106-59.

McNaney, Joseph T. Alphanumeric character recording apparatus. 3,621,138, Cl. 178-15.

McPherson, Neil Freeman; and Hanssmann, Nils, to Atomic Energy of Canada Limited. Method and apparatus for tig tube welding. 3,621,177, Cl. 219-61.

McWain, Richard: *See—*
Russell, George F.; and McWain, Richard,3,619,841.

Measurex Corporation: *See—*
Boissevain, Mathew G., 3,621,259.

M.E.D.I.: *See—*
Mieville, Andre, 3,621,184.

Medical Development Corporation: *See—*
Holbrook, LeGrand K.; and Ostler, David S., 3,620,408.

Meditron, Inc.: *See—*
Harvey, Robert J., 3,620,770.

Medlock, Odas V.: *See—*
Cain, Thomas R.; and Medlock, Odas V.,3,619,820.

Medovar, Boris Izrailevich; Baglia, Vitaly Mikhailovich; Sevruk, Albert Nikolaevich; and Latash, Jury Vadimovich. Method of producing ingots, in particular, slab ingots, by electroslag remelting of consumable electrodes. 3,620,287, Cl. 164-52.

Meeks, Gene A., to International Telephone and Telegraph Corporation. Plasma multipactor. 3,621,454, Cl. 331-92.

Mefferd, Wayne S.: *See—*
Rorden, Robert J.; Dowley, Mark W.; and Mefferd, Wayne S.,3,621,273.

Mehta, Chandrakant: *See—*
Mitchell, Daniel M.; and Mehta, Chandrakant,3,621,373.

Melpar, Inc.: *See—*
Conant, John E.; and Buczek, Walter F., 3,619,912.

Memmel, Ferdinand: *See—*
Gossel, Hartmut; Merkle, Kurt; and Memmel, Ferdinand,3,620,793.

Mendelsohn, Nathan: *See—*
Nitkiewicz, Joseph; and Mendelsohn, Nathan,3,620,131.

Menzi, Ernst, AG: *See—*
Menzi, Ernst, 3,620,333.

Menzi, Ernst, to Menzi, Ernst, AG. Wheel blocking arrangement for an excavating machine. 3,620,333, Cl. 188-30.

Mercer, Francis T.; and Petersen, Frederick A., Jr., to Mattel, Inc. Position responsive voice unit. 3,620,538, Cl. 274-1.

Merck & Co., Inc.: *See—*
Jensen, Norman P.; and Windholz, Thomas B., 3,621,036.

Merck, E., A.G.: *See—*
Fruhstorfer, Wolfgang; Namenyi, Istvan; Baumer, Wilhelm; and Dennler, Bernd, 3,621,034.

Merdes, Hartmut: *See—*
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Voemel, Wolfgang; and Sauer, Winfriede,3,621,022.

Meridian Industries, Inc.: *See—*
Kolster, Wilhelm K., 3,621,115.

Merino, Dennis H.: *See—*
Thompson, Norman C.; and Merino, Dennis H.,3,619,937.

Merit Abrasive Products, Inc.: *See—*
Burns, Russell W., 3,619,948.

Merkle, Kurt: *See—*
Gossel, Hartmut; Merkle, Kurt; and Memmel, Ferdinand,3,620,793.

Merlin Gerin, Societe Anonyme: *See—*
Reyx, Philippe, 3,621,349.

Merrill, Claude I.,: *See—*
Anderson, Richard W.; and Merrill, Claude I.,,3,621,066.

Merrill, Edward S.: *See—*
Fonda-Bonardi, Giusto, 3,620,017.

Merrill, Frederick F., to Steelcase, Inc. Double acting door hinge. 3,619,853, Cl. 16-164.

Merten, Rudolf: *See—*
Diehr, Hans Joachim; Merten, Rudolf; Piechota, Helmut; and Uhlig, Konrad,3,620,986.

Messer Griesheim GmbH: *See—*
Herbrich, Horst, 3,621,198.

Messer, Mayer Naoum: *See—*
Farge, Daniel; Moutonnier, Claude; and Messer, Mayer Naoum,3,621,037.

Messer, Philip Joseph: *See—*
Richter, Ferdinand Joseph; and Messer, Philip Joseph,3,619,843.

Messrs. Gebruder Junghans Gesellschaft mit Beschraenkter Haftung: *See—*
Ganter, Wolfgang; and Otto, Heinz, 3,620,005.

Messwarb, Gunter: *See—*
Steppan, Hartmut; Messwarb, Gunter; and Luders, Walter,3,620,733.

Mesta Machine Company: *See—*
Prokell, John L., 3,620,062.

Metal Craft Company, The: *See—*
Nordell, Edwin A., 3,620,027.

Metals Research Limited: *See—*
Fisher, Colin, 3,621,129.

Metcalfe, Kenneth A.: *See—*
Hastwell, Peter J.; and Metcalfe, Kenneth A.,3,620,722.

Methode Development Company: *See—*
Schroeder, Duane Arthur; Weiss, Alvin Dennis; and Giltner, Benedict Clare, 3,620,840.

Mettler Electronics Corporation: *See—*
Davis, Jerome W., 3,620,221.

Metzler, Elmar: *See—*
Kraus, Thaddaus; Paesold, Gerold; and Metzler, Elmar,3,619,839.

Meuleman, Johannes: *See—*
Cacheux, Jean Antoine; and Meuleman, Johannes,3,621,256.

Mewecco Fleury Mechanische Werkstatte: *See—*
Fleury, Josef Viktor, 3,619,902.

Meyer, Daniel A.: *See—*
Hartz, Walter A.; Meyer, Daniel A.; and Sommer, John G., Jr.,3,620,901.

Michl, Horst: *See—*
Ilgen, Erich; and Michl, Horst,3,619,854.

Middour, Donald R.: *See—*
Henry, Nelson R.; and Middour, Donald R.,3,620,316.

Midland-Ross Corporation: *See—*
Floehr, Walter L., 3,620,169.
Floehr, Walter L., 3,620,170.

Mieville, Andre, to M.E.D.I. Spot welding apparatus. 3,621,184, Cl. 219-127.

Mil-An Mfg., Corporation: *See—*
Howard, Sol; and Schaaf, Robert, 3,619,989.

Miles Laboratories, Inc.: *See—*
Morison, Ayers, 3,620,677.

Miles, Paul H. A. Cattle crushes. 3,620,194, Cl. 119-98.

Miles, T. William: *See—*
Kubo, Moritada; Takahashi, Yukiharu; and Miles, T. William,3,621,357.

Miller, Bernard; and English, Jackson Pollard, to American Cyanamid Company. Quinoxalinyl N⁴-oxide phosphates, methods of preparation and use of same as pesticides. 3,621,021, Cl. 260-250.

Miller, Billy G. Surface-treating apparatus and method. 3,619,954, Cl. 51-170.

Miller, Carl A., to Economics Laboratory, Inc. Foam generating apparatus and method of use. 3,620,231, Cl. 134-15.

Miller, Carles G., to California Institute of Technology. Depressurization of arc lamps. 3,621,330, Cl. 315-108.

Miller, David E., to General Electric Company. Means for inhibiting flutter in a numerical display. 3,621,391, Cl. 324-99.

Miller, Edwin B., Sr., to Bethlehem Steel Corporation. Furnace refractory supporting structure. 3,620,178, Cl. 110-99.

Miller, Justin G., deceased0 (by Miller, Rita A.; administratrix), to Lear Siegler, Inc. Aircraft command mixing device. 3,620,488, Cl. 244-77.

Miller, Rita A.: *See—*
Miller, Justin G.,3,620,488.

Miller, Robert G.; and Radaker, Ernest H., to Phillips Mine & Mill Supply Co. Industrial trailer with selective one or two end steering. 3,620,549, Cl. 280-99.

Mills, Justin W., Jr.: *See—*
Stropie, Gordon N.; and Mills, Justin W., Jr.,3,620,265.

Minakuchi, Hideharu: *See—*
Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio,3,621,087.

Minami, Shigeo, to Hatachi, Ltd. Data processing system for curves recording on charts whose trace varies in width. 3,621,222, Cl. 235-181.

Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W., to Udylite Corporation, The. Method of treating workpieces in a treating fluid. 3,620,813, Cl. 117-94.

Mine Safety Appliances Company: *See—*
Wise, Layton A., 3,620,407.

Minick, George A.: *See—*
Studebaker, James B.; Minick, George A.; and Whittier, John D.,3,620,642.

Minnesota Mining and Manufacturing Company: *See—*
Bergstrom, Theodore R., 3,620,690.

Minolta Camera Kabushiki Kaisha: *See—*
Hayashi, Sadashige, 3,620,619.
Hayashi, Toshio, 3,620,144.

Misawa, Toshio, to Bell Telephone Laboratories, Incorporated. Negative resistance avalanche diode structures. 3,621,466, Cl. 331-107.

Misencik, John J., to Westinghouse Electric Corporation. Photocontrol apparatus particularly for outdoor pole lantern. 3,621,269, Cl. 250-227.

Miserlis, Constantine D., to Badger Company, Inc., The. Method of separating isomers of mononitrotoluene. 3,620,928, Cl. 203-6.

M'·hcon, Lester; and Reagan, Donald W., to Singer Company, The. Striping box for circular knitting machines with adjustable finger-actuating jacks. 3,620,049, Cl. 66-138.

Mishkin, Abraham Rudolph; and Symbolik, William Stephen, to Societe d'Assistance Technique pour Produits Nestle S.A. Spray drying process. 3,620,776, Cl. 99-199.

Mitchell, Cyril John. Electric timing circuits. 3,621,276, Cl. 307-141.

Mitchell, Daniel M.; and Mehta, Chandrakant, to Collins Radio Company. Transient-free solid state power contactor. 3,621,373, Cl. 323-18.

Mitchell, David S.: *See—*
Bridge, Alan G.; Jaffe, Joseph; and Mitchell, David S.,3,620,968.

Mitsubishi Acetate Co., Ltd.: *See—*
Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi, 3,620,227.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 3,621,270.

Mitsubishi Rayon Co., Ltd.: *See—*
Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi, 3,620,227.

Mitsumi Electric Company Ltd.: *See—*
Yokoyama, Takeo; and Kitamura, Hiroshi, 3,621,309.

Miyakawa, Seiichi, to Katsurazawa Denki Kabushiki Kaisha. Corona discharge device with means to heat the discharge electrodes to increase the discharge current. 3,621,244, Cl. 250-49.5

Miyakoshi, Hisashi: *See—*
Uchida, Toshiyuki; Miyakoshi, Hisashi; and Murai, Shinichi,3,621,348.

Miyamoto, Noboru: *See—*
Fugiwara, Hirotomo; Arai, Takuya; and Miyamoto, Noboru,3,620,361.

Miyamoto, Ryou; Hashizume, Kunio; and Kitamura, Hiroshi, 1/2 to Toray Industries, Inc., and Kabushiki Kaisha. Method and apparatus for intermittently dyeing yarns. 3,620,662, Cl. 8-14.

Miyazaki, Gentaro: *See—*
Hirota, Ryoichi; Fujishima, Tohru; Miyazaki, Gentaro; Iwasaki, Tadahiko; Akatsu, Mitsuharu; and Kinoshita, Tomoo,3,621,123.

Mizushina, Jun: *See—*
Tanaka, Yukio; Mizushina, Jun; Yamagishi, Hitoshi; and Kosaki, Hiroshi,3,621,102.

M&J Valve Company: *See—*
Van Arsdale, Lyle R.; Lathrop, Francis M.; and Reaves, Vernon R., 3,620,236.

Mo och Domsjo Aktiebolag: *See—*
Eriksson, Erik Helmer; Hogberg, Lars-Gunnar; Kempe, Carl Peter Seth; and Lofgren, Stig-Gunnar, 3,620,272.

Mobil Oil Corporation: *See—*
Ireland, Henry R., 3,620,961.
Nichols, Dean P.; and Strange, Lloyd K., 3,620,301.
Rosinski, Edward J., 3,620,965.
Stover, William A.; and Oleck, Stephen M., 3,620,964.

Mochizuki, Kazuo; Otsuka, Hiroyasu; Katumata, Hideo; Oka, Tetuo; and Tanaka, Masao, to Kyowa Hakko Kogyo Co., Ltd. Process for purifying L-asparaginase. 3,620,925, Cl. 195-66.

Moen, Alfred M.: *See—*
Mongerson, Paul A.; Moen, Alfred M.; and Bell, Frank W.,3,620,254.

Moffitt, Jerrell F.: *See—*
Badger, Algernon S.; and Moffitt, Jerrell F.,3,621,410.

Moffitt, Lee R., to Hewlett-Packard Company. Time delay reflectometer. 3,621,325, Cl. 315-25.

Molex Products Company: *See—*
Horecky, Stanley V.; and McDonough, Cletus, 3,621,445.

Molins Machine Company Limited: *See—*
Maw, Philip A., 3,620,092.
McCombie, Alan K., 3,620,349.

Molins Organisation Limited, The: *See—*
Youngman, Derek Henry; and Davies, Robert William, 3,620,874.

Moller, Siegfried: *See—*
Oei, Han Yong; and Moller, Siegfried,3,620,822.

Mondry, Leo: *See—*
Passaro, Frank; Ross, Ned; and Mondry, Leo,3,619,964.

Mongerson, Paul A.; Moen, Alfred M.; and Bell, Frank W., to Standard Screw Company. Handle valve. 3,620,254, Cl. 137-625.17

Monroe, James E., Jr., to United States of America, Atomic Energy Commission. Method of forming a thermal emissivity coating on a metallic substrate. 3,620,808, Cl. 117-69.

Monsanto Company: *See—*
Anderson, George J.; and Dahms, Ronald H., 3,620,902.
Bryan, Roland J., Jr., 3,620,818.
Cholmar, Sidney, 3,619,862.
Dahms, Ronald H.; and Anderson, George J., 3,620,908.
Ridgway, James S., 3,621,002.
Rump, John H., 3,620,403.
Rump, John H., 3,620,411.
Schleppnik, Alfred A.; and Oftedahl, Marvin L., 3,621,063.
Slade, Philip E.; Estes, Robert T.; and Randall, James C., 3,620,824.
Smith, Andrew L., 3,620,823.
Wall, Robert F., 3,621,162.
Wygant, James C., 3,621,069.
Young, Evan Johnson; and Summers, Charles Gene, 3,620,980.

Montgomery, James L.: *See—*
Brown, Archer W.; Montgomery, James L.; and Erkenbrack, Lorraine V.,3,620,579.

Moore, Dorothy J.: *See—*
Allen, Robert Carter; and Moore, Dorothy J.,3,620,947.

Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Process for preparing stable positively charged alumina coated silica sols. 3,620,978, Cl. 252-313.

Moore, Eugene B.: *See—*
Comstock, Richard Lawrence; and Moore, Eugene B.,3,620,841.

Moore, Harold R.: *See—*
Bennon, Saul; and Moore, Harold R.,3,621,426.

Moore, Jack P.: *See—*
Snyder, Clermont J.; and Moore, Jack P.,3,620,853.

Morelock, Charles R., to General Electric Company. Boro-carbon coated filaments. 3,620,836, Cl. 117-216.

Morgan, David: *See—*
Morgan, Esther A.; and Morgan, David,3,619,922.

Morgan, Esther A.; and Morgan, David. Changeable exhibitor. 3,619,922, Cl. 64-3.

Morgan, John Randolph: *See—*
Warren, Glenn B.; and Morgan, John Randolph,3,620,201.

Mori, Ernest A.: *See—*
Gaylord, Eber W.; and Mori, Ernest A.,3,620,653.

Mori, Yoichi: *See—*
Maeda, Riichi; and Mori, Yoichi,3,620,323.

Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakajima, Jun, to Furukawa Electric Company Limited, The. Continuous winding apparatus. 3,621,190, Cl. 219-155.

Morin, Albert Z. Snow clearing and melting apparatus. 3,619,918, Cl. 37-12.

Morin, Theodore Joseph: *See—*
Prevett, Peter Dominec; and Morin, Theodore Joseph,3,621,175.

Morino, Hideki: *See—*
Tomita, Yukio; Ito, Shinichi; Sogo, Yoshitaka; and Morino, Hideki,3,620,338.

Morison, Ayers, to Miles Laboratories, Inc. Indicating device. 3,620,677, Cl. 23-253.

Morkovin, Nikolai Viktorovich: *See—*
Kleiman, Jury Lvovich; Morkovin, Nikolai Viktorovich; and Kornilov, Nikolai Ilich,3,621,378.

Mormont, Rene; and Duez, Jean, to Solvay & Cie. Quantitative gas analysis apparatus. 3,619,986, Cl. 55-158.

Moroe, Tatsuo; Hattori, Satohiko; Komatsu, Akira; and Yamaguchi, Yuzo, to Takasago Perfumery Co., Ltd. Method for the biochemical isolation of l-menthol. 3,620,918, Cl. 195-2.

Morrell, Jacque C. Method of making dental impression and dental stones having smooth surfaces. 3,620,778, Cl. 106-35.

Morris, Philip, Incorporated: *See—*
Braginetz, Paul A., 3,619,901.

Morrison, Alexander Robley; and Herrmann, Heinz Dieter, to Balm Paints Limited. Metal pre-treatment and coating process. 3,620,949, Cl. 204-181.

Morrison, Robert, to Speedcranes Limited. Cranes, derrricks, or the like lifting gear. 3,620,504, Cl. 254-188.

Morrissey, Richard T.; and Hess, Nelson C., to Goodrich, B. F., Company, The. Supple poromeric laminate. 3,620,811, Cl. 117-76.

Morrow, Elmore F., to Boeing Company, The. Aircraft crewseat. 3,620,568, Cl. 297-307.

Morse, Charles E.; and Smith, John P., to Bell Telephone Laboratories, Incorporated. Key telephone station having multinetwork access. 3,621,146, Cl. 179-18.

Morse, Charles H.: *See—*
Martin, James S.; and Morse, Charles H.,3,619,928.

Morse, Hugh B.; and Foster, Thomas W., to Fibreboard Corporation. Severable carton with sterile edge. 3,620,439, Cl. 229-51.

Morse, Hugh B.: *See—*
Theys, Ezra E.; Morse, Hugh B.; and Johnson, Robert B.,3,619,977.

Moser, Leonard M.: *See—*
Raven, Richard C.; and Moser, Leonard M.,3,621,307.

Mosier Industries, Inc.: *See—*
Wright, Lee A., 3,620,016.

Motorola, Inc.: *See—*
Clark, Lowell E., 3,621,300.
Shult, Dale L., 3,621,484.

Motter, Robert F.: *See—*
Marchant, John C.; and Motter, Robert F.,3,620,747.

Moulton, John R.: *See—*
Sturtz, David; and Moulton, John R.,3,620,443.

Moutonnier, Claude: *See—*
Farge, Daniel; Moutonnier, Claude; and Messer, Mayer Naoum,3,621,037.

Moyroud, Louis M. Photographic type composing machine. 3,620,140, Cl. 95-4.5

Moyroud, Louis M. Photographic type composing machine. 3,620,141, Cl. 95-4.5

M&T Chemicals Inc.: *See—*
Larkin, William A.; and Treadwell, Kenneth, 3,620,985.
Seltzer, Raymond, 3,621,030.

Mucciarone, Rocco H.: *See—*
Budzyna, Joseph M.; and Mucciarone, Rocco H.,3,620,259.

Mueller, Armand G.; Bast, Orval C.; and Schmeling, William H., to Square D Company. Electric switch and door interlock operating mechanism. 3,621,161, Cl. 200-50.

Mueller Co.: *See—*
Finney, Robert R.; Luckenbill, Lawrence F.; and Kissell, Gerry E., 3,620,245.

Mueller Color Plate Company: *See—*
Anderson, Robert E., 3,620,877.

Mueller, Foster. Food fabricator. 3,620,172, Cl. 107-1.

Mueller, Peter F.: *See—*
Parrent, George B., Jr.; and Mueller, Peter F.,3,620,611.

Mueller, Willy; and Steinlin, Felix, to Ciba Limited. Sparingly soluble organic dyestuffs. 3,620,788, Cl. 106-288.

Muench, Paul W., to Borg-Warner Corporation. Purging apparatus for refrigeration system. 3,620,038, Cl. 62-195.

Mugica Irastorza, Javier. Electronic tone generator. 3,621,106, Cl. 84-1.28

Mulaskey, Bernard F., to Chevron Research Company. Catalytic dewaxing. 3,620,963, Cl. 208-111.

Muller, Helmut: *See—*
Aramasow, Waldemar; Muller, Helmut; and Lindenthal, Hans,3,620,319.

Muller, Helmut. Benzophenonehexacarboxylic acid-4,5,4',5'-dianhydride- 2,2'-dilactone. 3,621,039, Cl. 260-343.3

Muller, Richard; Irmisch, Reiner; and Rotzsche, Harald, to Institut fur Silikon- und Fluorkarbon-Chemie. Process for the preparation of organofluoro- silanes. 3,621,045, Cl. 260-448.2

Mullin, Joseph V.: *See—*
Jakas, Rimvydas P.; and Mullin, Joseph V.,3,619,869.

Multifastener Company: *See—*
Keough, William R., 3,620,517.

Munck, Fredrik, to Sverre Munck A/S. System for transporting goods to and from storage shelves. 3,620,389, Cl. 214-16.4

Munte, Harm-Heinrich, to Blohm & Voss AG. Jet propulsion drive for watercraft. 3,620,019, Cl. 60-221.

Murai, Shinichi: *See—*
Uchida, Toshiyuki; Miyakoshi, Hisashi; and Murai, Shinichi,3,621,348.

Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Mashiro; and Arima, Hideki, to Yamanouchi Pharmaceutical Co., Ltd. Formamido-cycloalkane derivatives. 3,621,058, Cl. 260-561.

Murayama, Yoshio; and Kamura, Masao, to Kabushiki Kaisha Meidensha. Reversible operating apparatus. 3,621,314, Cl. 310-101.

Murdock, Forrest L., Sr. Apparatus for desalting crude. 3,620,959, Cl. 204-302.

Murdock, Robert H., to Railtec Corporation. Railing construction. 3,620,505, Cl. 256-70.

Murotani, Masayoshi; Tanaka, Ryoichi; Tachikawa, Keiji; and Shimamura, Tadao, to Nippon Telegraph & Telephone Public Corporation, and Nippon Electric Company, Limited. PCM transmission system. 3,621,397, Cl. 325-38.

Murphy, William P. Jr., to Cordis Corporation. Cardiac pacer with redundant power supply. 3,620,220, Cl. 128-419.

Murray, Jack T., to International Business Machines Corporation. Frequency domain analyzer using variable-rate time compression. 3,621,389, Cl. 324-77.

Murray, Leo Thomas, to Colgate-Palmolive Company. Textile softener composition. 3,620,807, Cl. 117-66.

Murray, William: *See—*
Walker, Gordon Richard; and Murray, William,3,620,253.

Muskat, Josef; Klump, Dieter; and Sieckmann, Jurgen, to Passavant-Werke. Aerating apparatus. 3,620,512, Cl. 261-92.

Muth, Karl: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut,3,621,057.

Mykietyn, Edward: *See—*
Rosen, Arye; and Mykietyn, Edward,3,621,367.

Naczkowski, Bruno R., to North American Rockwell Corporation. Permanent ship mooring system. 3,620,181, Cl. 114-0.5

Nagae, Masaomi; and Yokokawa, Sumio, to Fuji Denki Seizo Kabushiki Kaisha. Automatic voltage regulating apparatus for A.C. generator with anti-Hunt means. 3,621,369, Cl. 322-19.

Naiman, Charles S.: *See—*
Schwartz, Jacob; and Naiman, Charles S.,3,620,597.

Nakajima, Jun: *See—*
Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakajima, Jun,3,621,190.

Nakamura, Isei: *See—*
Kobayashi, Tatsuyoshi; and Nakamura, Isei,3,621,053.

Nakata, Roy, to General Electric Company. Electrical insulator and method of making. 3,621,109, Cl. 174-16.

Nakayama, Fumio: *See—*
Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi,3,620,227.

Nakayama, Kunihiro; Kojima, Keiichi; and Kobayashi, Shingo, to Nikon Kentetsu Kabushiki Kaisha. Method and apparatus for manufacturing finned pipes. 3,621,178, Cl. 219-107.

Nalco Chemical Corporation: *See—*
Stanford, James R.; and Vogelsang, Paul G., Jr., 3,620,974.

Nalle, George S., Jr. Apparatus for extruding plastic netting. 3,620,883, Cl. 156-500.

Namenyi, Istvan: *See—*
Fruhstorfer, Wolfgang; Namenyi, Istvan; Baumer, Wilhelm; and Dennler, Bernd,3,621,034.

National Can Corporation: *See—*
Griese, Elmer W., Jr., 3,620,410.

National Cash Register Company, The: *See—*
Janning, John L., 3,621,332.
Maierson, Theodore, 3,619,842.

National Research Development Corporation: *See—*
Hardman, Roland, 3,620,919.

National Starch and Chemical Corpoation: *See—*
Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Field, Stanely, 3,620,729.

National Twist Drill and Tool Company: *See—*
Pahlitzsch, Gotthold, 3,619,880.

Natschke, Eldred H., to Universal Railway Devices Company. High power hand brake and chain stop therefor. 3,620,098, Cl. 74-505.

Natural Products Company: *See—*
Lisowski, John A.; and Lisowski, Frank B., 3,620,937.

Neal, Morris P., deceased, late of Clearwater, (by Neal, James L., executor); Reichert, Donald G.; and Fradenburgh, John, to A-B-C Packaging Machine Corporation. Method of carton sealing. 3,620,138, Cl. 93-36.3

Nebendorf, Heinrich, to Gebr. Hilgeland. Ejecting device for bolts from the matrix of a bolt press. 3,619,835, Cl. 10-11.

Needleman, Lawrence. Distribution of food in an eatery. 3,619,920, Cl. 40-2.

Neiderprum, Hans: *See—*
Dahm, Manfred; Neiderprum, Hans; and Simmler, Walter,3,620,984.

Neidhardt, Manfred; and Schneider, Joseph, to Dynamit Nobel Aktiengesellschaft. Electrical heating element with fused magnesia insulation. 3,621,204, Cl. 219-553.

Neidigh, Rodger V.: *See—*
Alexeff, Igor; Neidigh, Rodger V.; and Wing, William Ray,3,621,223.

Neiper, Hans Alfred. Therapeutically effective calcium diarotate. 3,621,024, Cl. 260-256.4

Neisch, James C.; and Holmes, Alton B., to North American Rockwell Corporation. Brake control system. 3,620,577, Cl. 303-21.

Neller, William C.: *See—*
Brooke, Thomas A.; and Neller, William C.,3,620,346.

Nelson, Alden W., to Crompton & Knowles Corporation. Extrusion apparatus. 3,619,859, Cl. 18-12.

Nelson, Clifford L.; and Sutton, David J., to Honeywell Inc. Clock thermostat system. 3,620,448, Cl. 236-46.

Nelson, James E.: *See—*
Hwoschinsky, Vladimir; Nelson, James E.; and Westcott, Paul W.,3,620,683.

Nelson, Richard: *See—*
Bolt, Henry; and Nelson, Richard,3,620,496.

Nelson, Victor R. Method and apparatus for assembling veneer plies into laid-up plywood panels. 3,620,887, Cl. 156-563.

Neri, Anthony. Athletic shoe. 3,619,916, Cl. 36-59.

Nester & Faust Manufacturing Corporation: *See—*
Conlon, Ralph D.; and Fleisher, William M.,IV, 3,620,134.

Netheler, Heinrich; Bergmann, Wilhelm; and Bechtler, Gunter, to Eppendorf Geraetebau Netheler & Hinz GmbH. Method and apparatus for sequential testing of a plurality of specimens. 3,621,215, Cl. 235-151.3

Neumann, John W.: *See—*
Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W.,3,620,813.

Neuschotz, Robert. Manufacture of fastener utilizing deformed thread as stop shoulder. 3,619,834, Cl. 10-2.

New London Mills, Inc.: *See—*
Kemmler, James W., 3,620,890.

Newalls Insulation & Chemical Company Limited: *See—*
Graham, Robert, 3,620,258.

Newberry, Meigs W., to General Instrument Corporation. Variable resistor. 3,621,439, Cl. 338-180.

Newberry, Robert Anthony, to Wyeth, John, & Brother Limited. Certain 2-thiazolinealkanoic acids and esters. 3,621,028, Cl. 260-306.7

Newbold, Robert M. Apparatus for removing air pollutants from the exhaust stream of a combustion process. 3,620,008, Cl. 60-30.

Newman, Douglas A., to Columbia Ribbon & Carbon Mfg., Co., Inc. Duplicating ribbons and process. 3,620,802, Cl. 117-36.4

Newman, Joseph W. Aquatic recreational device. 3,620,529, Cl. 272-56.

Newton, Frank, to Imperial Chemical Industries Limited. Falling film evaporator for concentrating liquids. 3,620,282, Cl. 159-13.

Nichols, Dean P.; and Strange, Lloyd K., to Mobil Oil Corporation. Method of in situ retorting oil shale. 3,620,301, Cl. 166-251.

Niederst, Jean Pierre: *See—*
Kannegiesser, Herbert; Niederst, Jean Pierre; and Juraschek, Richard,3,620,881.

Nier, Erich-Arthur. Method of making container closure. 3,620,862, Cl. 156-69.

Nikon Kentetsu Kabushiki Kaisha: *See—*
Nakayama, Kunihiro; Kojima, Keiichi; and Kobayashi, Shingo, 3,621,178.

Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Hydrostatic extrusion of compound material. 3,620,059, Cl. 72-60.

Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.): *See—*
Takamatsu, Naokichi, 3,621,105.

Nippon Electric Company, Limited: *See—*
Murotani, Masayoshi; Tanaka, Ryoichi; Tachikawa, Keiji; and Shimamura, Tadao, 3,621,397.

Nippon Kayuku Kabushiki Kaisha: *See—*
Ono, Nobujiro; Hattori, Hiroshi; Tada, Shoji; and Kaida, Tsunetoshi,3,621,009.
Nippon Kokan Kabushiki Kaisha and Rederiaktiebolaget Helsingborg: *See—*
Mansson, Harry, 3,620,388.
Nippon Seiko Kabushiki Kaisha: *See—*
Ooki, Nobugi; and Okoshi, Hideo, 3,619,870.
Nippon Telegraph & Telephone Public Corporation: *See—*
Murotani, Masayoshi; Tanaka, Ryoichi; Tachikawa, Keiji; and Shimamura, Tadao, 3,621,397.
Nishida, Takuji: *See—*
Iikubo, Yuichi; Nishida, Takuji; and Furukawa, Yoshiki,3,620,030.
Nishimoto, Tetsunori, to Hitachi, Ltd. High speed divider utilizing carry save addition. 3,621,218, Cl. 235-164.
Nishiwaki, Koji: *See—*
Yasuda, Kazuo; Uchino, Koichi; Nishiwaki, Koji; and Inomata, Hiroshi,3,620,628.
Nisley, Larry V., to Robertshaw Controls Company. Vacuum regulator and pneumatically operated fuel control system utilizing the same. 3,620,244, Cl. 137-315.
Nissan Motor Company, Limited: *See—*
Maeda, Riichi; and Mori, Yoichi, 3,620,323.
Nissl, Max: *See—*
Riedel, Anton; and Nissl, Max,3,620,469.
Nitkiewicz, Joseph, to Ex-Cell-O Corporation. Rotary-linear actuator. 3,620,132, Cl. 92-2.
Nitkiewicz, Joseph; and Mendelsohn, Nathan, to Ex-Cell-O Corporation. Rotary-linear dual-directional rotating actuator. 3,620,131, Cl. 92-2.
NL Industries, Inc.: *See—*
Pulvari, Charles F.; and Urban, Stephen F., 3,621,343.
Noda, Hajime: *See—*
Sugiyama, Masao; Suzuki, Toshio; Noda, Hajime; Kashimura, Saburo; Hato, Shozo; and Tanaka, Hideo,3,621,119.
Noddings, Charles R.; Dietzler, Andrew J.; and Gates, Ronald G., to Dow Chemical Company, The. Method for dehydrogenating and cracking alkanes and olefins. 3,621,071, Cl. 260-678.
Noe, Robert Joseph: *See—*
Willems, Jozef Frans; Noe, Robert Joseph; Vanheertum, Johannes Josephus; and Van Paesschen, August Jean,3,620,742.
Noell, Godwin L.: *See—*
Sobanski, Stanley J.; Mastriforte, Otil F.; and Noell, Godwin L.,3,619,882.
Nomura, Yasuaki: *See—*
Kawamura, Toshiki; Ohneda, Tohru; Nomura, Yasuaki; and Taguchi, Kikuo,3,620,445.
Nordberg, Birger: *See—*
Dalmo, Bror; Franked, John; Landhult, Hans; Nordberg, Birger; Ronnevig, Carl; and Tjernstrom, Ove,3,621,315.
Nordell, Edwin A., to Metal Craft Company, The. Dock structure. 3,620,027, Cl. 61-48.
Nordman, Leonard: *See—*
Wenger, Jerry A.; Douglas, Daryl D.; Urch, Harvey M.; Nordman, Leonard; and Polivka, John N.,3,620,564.
Normos, Norbert, to La Societe Financiere Pour la Recherche et l'Industrie. Containers. 3,620,420, Cl. 222-386.5
North American Rockwell Corporation: *See—*
Budzyna, Joseph M.; and Mucciarone, Rocco H., 3,620,259.
Fujimoto, Ted Y., 3,621,291.
Gibson, Earl D., 3,621,139.
Greenewald, Herbert, Jr., 3,620,854.
Iceland, William F.; and Lien, Donald R., 3,621,185.
Naczkowski, Bruno R., 3,620,181.
Neisch, James C.; and Holmes, Alton B., 3,620,577.
Northrop Weaving Machinery Limited: *See—*
Atkinson, Cyril M., 3,620,262.
Norwood, Richard E.: *See—*
Baumann, Gerald W.; Norwood, Richard E.; and Rueger, William J.,3,620,430.
Nosley, Jacques A. Fluid flow measuring apparatus. 3,620,079, Cl. 73-194.
Noss, Ronald M.: *See—*
Bauer, Randy L.; Johnson, David C.; and Noss, Ronald M.,3,620,804.
Nothdurft, Heinz: *See—*
Hofer, Gerald; and Nothdurft, Heinz,3,620,647.
Hofer, Gerald; and Nothdurft, Heinz,3,620,648.
Notley, Norman T. Vehicles for vesicular photographic materials. 3,620,743, Cl. 96-49.
Novopress GmbH & Co., Kg: *See—*
Dischler, Helmut, 3,619,885.
Nozaki, Kanzo Kawaguchi: *See—*
Hasegawa, Kazuaki; Nozaki, Kanzo Kawaguchi; and Yokoyama, Katsuyoshi,3,620,281.
Oates, Frank, to Southalls (Birmingham) Limited. Incontinence pads. 3,620,894, Cl. 161-114.
Oberholtzer, Robert M., to Dyers, O. B., Inc. Process for avoiding creases in tubular knit acrylic fabrics. 3,619,831, Cl. 56-13.1
O'Cheskey, Theodore H., to United States Filter Corporation. Mounting means for electrical devices. 3,621,173, Cl. 200-168.
O'Daniel, Jerome B.:*See—*
Clancy, Douglas E.; and O'Daniel, Jerome B.,3,620,344.
Oei, Han Yong; and Moller, Siegfried, to Hooker Chemical Corporation. Process of copper plating super-refined steel. 3,620,822, Cl. 117-130.
Office National d'Etudes et de Recherches Aerospatiales (par abreviation: O.N.E.R.A.):*See—*
Galmiche, Philippe; Hivert, Andre R.; and Marty, Michel E., 3,620,720.
Oftedahl, Marvin L.: *See—*
Schleppnik, Alfred A.; and Oftedahl, Marvin L.,3,621,063.
Ogihara, Akira, to Olygin Optical Corporation. Threaded type coupling device for coupling a lens barrel with a camera body. 3,620,149, Cl. 95-44.
Ogilby, Lydia Phippen. Honey-extracting method and apparatus. 3,619,828, Cl. 6-12.
O'Grady, Michael Hugh, to Wiggins Teape Research & Development Limited. Sized transfer sheet. 3,620,801, Cl. 117-36.4
Ohlsson, Leonard W.: *See—*
Clearman, Jack F.; Ohlsson, Leonard W.; and Sitko, Robert H.,3,620,040.
Ohneda, Tohru: *See—*
Kawamura, Toshiki; Ohneda, Tohru; Nomura, Yasuaki; and Taguchi, Kikuo,3,620,445.
Oil States Rubber Co.: *See—*
Collins, Wilbur W.; and Yost, Jack L., 3,619,844.
Ojakaar, Leo, to Du Pont de Nemours, E. I., and Company. Process for trimerizing polyisocyanates. 3,621,020, Cl. 260-248.
Ojima, Takashi: *See—*
Yoshida, Teruo; Sagara, Takaaki; Ojima, Takashi; Takahashi, Reiji; and Takahashi, Masahiro,3,620,762.
Oka, Tetuo: *See—*
Mochizuki, Kazuo; Otsuka, Hiroyasu; Katumata, Hideo; Oka, Tetuo; and Tanaka, Masao,3,620,925.
Okabe, Masanaga; Yoshihara, Toshio; and Hamaoka, Kenji, to Hooker Chemical Corporation. Chromate chemical coating solution for zinc alloy. 3,620,777, Cl. 106-14.
Okachi, Ryo: *See—*
Abe, Shigeo; Furuya, Akira; and Okachi, Ryo,3,620,921.
Okawa, Takao: *See—*
Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio,3,621,087.
Okoshi, Hideo: *See—*
Ooki, Nobugi; and Okoshi, Hideo,3,619,870.
Oldberg Manufacturing Company: *See—*
Hall, James R., 3,620,330.
Oleck, Stephen M.: *See—*
Stover, William A.; and Oleck, Stephen M.,3,620,964.
Olieman, Pieter F.: *See—*
Witzel, Homer D.; and Olieman, Pieter F.,3,620,223.
Olin Corporation: *See—*
Kober, Ehrenfried H.; and Schnabel, Wilhelm J., 3,620,929.
Olin Mathieson Chemical Corporation: *See—*
Faust, John P.; Jache, Albert W.; and Klanica, Andrew J., 3,620,689.
Olivier, James Peter; and Hickin, George Keller, to Freeport Sulphur Company. Apparatus and process for determining particle size by X-ray absorption analysis. 3,621,243, Cl. 250-43.5
Olivier, Kenneth L. Production of methacrylic acid. 3,621,054, Cl. 260-533.
Olofsson, Sven Skalby: *See—*
Tysk, Jan Erik; Olofsson, Sven Skalby; and Jacobson, Nils Bertil,3,620,215.
Olsen, Charles R. Radial actuator and release mechanism. 3,620,121, Cl. 89-1.
Olson, Carter L., to Upjohn Company, The. Apparatus for the measurement of dissolution rates. 3,620,675, Cl. 23-230.
Olson, Hilding Matthews, Jr., to Bell Telephone Laboratories, Incorporated. Negative resistance diode coaxial oscillator with resistive spurious frequency suppressor. 3,621,463, Cl. 331-101.
Olson, Lloyd J.: *See—*
Kozlowski, Robert H.; and Olson, Lloyd J.,3,620,960.
Olsson, Erik Allan, to Olsson International, Inc. Slab casting apparatus. 3,620,285, Cl. 164-274.
Olsson International, Inc.: *See—*
Olsson, Erik Allan, 3,620,285.
Olygin Optical Corporation: *See—*
Ogihara, Akira, 3,620,149.
Omholt, Ray E., to Powerlock Floors, Inc. Flooring system. 3,619,963, Cl. 52-483.
Ono, Nobujiro; Hattori, Hiroshi; Tada, Shoji; and Kaida, Tsunetoshi, to Nippon Kayuku Kabushiki Kaisha. Mixtures of phenyl-azo-phenyl dyestuffs. 3,621,009, Cl. 260-207.
Onoda Cement Company, Limited: *See—*
Iikubo, Yuichi; Nishida, Takuji; and Furukawa, Yoshiki, 3,620,030.
Ooki, Nobugi; and Okoshi, Hideo, to Nippon Seiko Kabushiki Kaisha. Drafting mechanism for a spinning machine. 3,619,870, Cl. 19-282.
Oppermann, Wilhelm; and Vogt, Johann, to Demag Aktiengesellschaft. Arrangement for a welded tube forming machine. 3,619,897, Cl. 29-475.
Optical Coating Laboratory, Inc.: *See—*
Spellman, Vernon C.; Bergfelt, Nils H.; and Small, Edward A., 3,619,840.

Optical Research and Development Corporation: *See—*
Humphrey, William E., 3,620,594.
Opto/Graphics, Inc.: *See—*
Smajo, Joseph J., 3,620,727.
O'Regan, Richard: *See—*
Dudderar, Thomas Dixon; and O'Regan, Richard, 3,620,589.
Orszagos Gumiipari Vallalat: *See—*
Bartha, Zoltan; Vad, Laszlo; Biro, Imre; and Farkas, Otto, 3,620,279.
Ortec, Incorporated: *See—*
Allen, Robert Carter; and Moore, Dorothy J., 3,620,947.
Osaka Prefecture: *See—*
Tanito, Keiko; Kato, Norio; Kinoshita, Shosaku; Kinoshita, Masahiro; and Sunada, Tsuyoshi, 3,620,944.
Oscar I., Judelshon, Inc.: *See—*
Chudyk, George, 3,620,114.
Oster, John Manufacturing Co.: *See—*
Blachly, Donald L.; and Smith, Richard A., 3,620,055.
Ostler, David S.: *See—*
Holbrook, LeGrand K.; and Ostler, David S., 3,620,408.
Oswald, Hendrikus Johan: *See—*
Li, Hsin Lang; Prevorsek, Dusan C.; and Oswald, Hendrikus Johan, 3,619,874.
Ota, Tadashi: *See—*
Sawada, Kingo; Kato, Shoichi; and Ota, Tadashi, 3,619,888.
Otoupalova, Jaroslava: *See—*
Stol, Miroslav; Chromecek, Richard; Stoy, Vladimir; Kliment, Karel; and Otoupalova, Jaroslava, 3,620,751.
Otsuka, Hiroyasu: *See—*
Mochizuki, Kazuo; Otsuka, Hiroyasu; Katumata, Hideo; Oka, Tetuo; and Tanaka, Masao, 3,620,925.
Ott, Louis E., to Standard Oil Company. Liquid fertilizers including soluble zinc from zinc oxide. 3,620,708, Cl. 71-33.
Otto, Heinz: *See—*
Ganter, Wolfgang; and Otto, Heinz, 3,620,005.
Outram, Michael Vaughan: *See—*
Halliwell, David George; Outram, Michael Vaughan; and Bryan-Brown, Martin Hume, 3,620,020.
Owens-Corning Fiberglas Corporation: *See—*
Janetos, Nicholas S.; Marzocchi, Alfred; and Leary, David E., 3,620,701.
Marzocchi, Alfred, 3,620,280.
Mc Marlin, Robert M., 3,620,787.
Owens-Illinois, Inc.: *See—*
Spanoudis, Louis, 3,620,706.
Oxford Aerosoles Limited: *See—*
MacGuire-Cooper, Richard Terence, 3,620,421.
Oxford, Desmond De Villiers. Mining method and apparatus therefor. 3,620,573, Cl. 299-35.
P & W Engineers, Inc.: *See—*
Rohr, Fred W., 3,619,983.
Rohr, Fred W., 3,619,985.
Pace, Robert E.: *See—*
Taylor, James W.; and Pace, Robert E., 3,621,447.
Pacific Vegetable Oil Corporation: *See—*
Cummings, Lowell O., 3,620,989.
Paciorek, Leonard J.; and Gerst, Carl W., to Anaren Microwave, Incorporated. Alternating current signal combing apparatus. 3,621,400, Cl. 325-446.
Paddington, Arthur L., to British Ropes Limited. Sealing ring for pipe coupling. 3,620,556, Cl. 285-110.
Paddington, Arthur Loftus, to British Ropes Limited. Boom loader. 3,620,268, Cl. 141-388.
Padmanathan, Thurairajah, to American Cyanamid Company. 1,3,2-Oxazaborinides and method for preparing the same. 3,621,023, Cl. 260-256.4
Paepke, Horst, to Warner & Swasey Company, The. Dial mechanism for knitting machine. 3,620,047, Cl. 66-25.
Paesold, Gerold: *See—*
Kraus, Thaddaus; Paesold, Gerold; and Metzler, Elmar, 3,619,839.
Page, Charles E., to Hazeltine Corporation. Flare light compensator in a flying spot scanner. 3,621,132, Cl. 178-7.2
Page, William R., to P.E.P. Inventions Inc. Seal plate stiffener ring for air brake service portion cover. 3,620,541, Cl. 277-237.
Pahlitzsch, Gotthold, to National Twist Drill and Tool Company. Circular saw blades or side-milling cutters with teeth of facett design. 3,619,880, Cl. 29-103.
Paillard S.A.: *See—*
Thevenaz, Jean, 3,620,472.
Paine, T. O., Administrator of the National Aeronautics and Space Administration with respect to an invention of,; and Heiney, Otto K. Self-obturating, gas-operated launcher. 3,619,924, Cl. 42-1.
Pallos, Laszlo: *See—*
Benko, Pal; Budai, Zoltan; and Pallos, Laszlo, 3,621,061.
Palmero, Albert, to Superior Electric Company, The. Simulated twelve pole stepping motor having eight actual poles. 3,621,312, Cl. 310-49.
Pancoe, Edward G., to Singer-General Precision, Inc. Motion system. 3,619,911, Cl. 35-12.
Pandit, Upendra Kumar; and Huisman, Henderikus Obias. Steroid intermediates. 3,621,019, Cl. 260-247.7
Papadatos, Dionysios D.; Deibel, Raymond A.; and Riester, William C., to Trico Products Corporation. Concealed windshield wiper system. 3,619,847, Cl. 15-250.16
Pappas, George W., to Sanders Associates, Inc. Speech processor for changing voice pitch. 3,621,150, Cl. 179-100.2
Paquet, Rene: *See—*
Gancberg, Abraam; Carpenter, Raymond; and Paquet, Rene, 3,620,453.
Paramount Health Equipment Corporation: *See—*
Annas, Robert F.; and Hinsberger, Vincent, 3,620,210.
Parke, Davis & Company: *See—*
Maddox, V Harold, 3,620,759.
Parker, Louis W. Muter for television receivers. 3,621,125, Cl. 178-5.8
Parker, Sidney A. Concrete building. 3,619,959, Cl. 52-223.
Parker-Hannifin Corporation: *See—*
Simmons, Harold C., 3,620,249.
Parkinson, Norman; Blakely, Christine Mary; and Russell, Robert Francis, to Scott Bader Company Limited 3 Atkins, Jack. Wallpaper. 3,620,366, Cl. 206-59.
Parmerter, Stanley Marshall, to CPC International Inc. Process of making paper and paper made therefrom using starch anthranilate. 3,620,913, Cl. 162-175.
Parr, Bryan R.: *See—*
Martindale, Allan; Parr, Bryan R.; and Smith, Michael J. S., 3,620,035.
Parrent, George B., Jr.; and Mueller, Peter F., to Technical Operations, Incorporated. Apparatus and methods for displaying or viewing educational materials or the like. 3,620,611, Cl. 353-20.
Parsons, Ralph M., Company, The: *See—*
Browder, Timothy J., Jr., 3,620,673.
Parsons, Robert W., to Marathon Oil Company. Sealing permeable zones in subterranean formations with heat sensitive solutions. 3,620,302, Cl. 166-258.
Partridge, Melvin H.; and Hargis, George R., III, to Vistron Corporation. Squeegee brush. 3,619,845, Cl. 15-117.
Passaro, Frank; Ross, Ned; and Mondry, Leo. Flooring panels. 3,619,964, Cl. 52-309.
Passavant-Werke: *See—*
Busse, Oswald; and Klesper, Hugo, 3,620,233.
Muskat, Josef; Klump, Dieter; and Sieckmann, Jurgen, 3,620,512.
Patent Structures, Inc.: *See—*
Leeds, Harry R., 3,621,079.
Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See—*
Rehmet, Manfred; and Begemann, Jurgen, 3,621,322.
Patrick, Robert F.: *See—*
McNally, Robert N.; and Patrick, Robert F., 3,620,782.
Paugh, Edward C.: *See—*
Arnold, Bruce K.; and Paugh, Edward C., 3,621,448.
Paul Forkardt Kommanditgesellschaft: *See—*
Heckmann, Gunter, 3,620,128.
Paul of Hawaii, Inc.: *See—*
Clark, James D., 3,620,605.
Paul Weber AG: *See—*
Schroeder, Peter, 3,620,052.
Paumier, Jacques: *See—*
Jacques, Gabriel; Zuech, Alphonse; Convers, Alain; and Paumier, Jacques, 3,621,068.
Pawlik, Gunter: *See—*
Engelsmann, Dieter; and Pawlik, Gunter, 3,620,142.
Payne, Sequoya L.: *See—*
Khalafalla, Sanaa E.; and Payne, Sequoya L., 3,620,715.
P. Beretta-Armi-Roma S.p.A.: *See—*
Beretta, Pier Carlo, 3,620,125.
Pearson, Clive Leonard, to British Petroleum Company Limited, The. Cutting nozzle. 3,620,457, Cl. 239-589.
Pease, Morris G., to Babcock & Wilcox Company, The. Self cleaning damper assembly. 3,620,242, Cl. 137-240.
Peehs, Martin; and Wendler, Friedrich, to Siemens Aktiengesellschaft. Method of densification of porous layers. 3,620,838, Cl. 117-217.
Peis, Gunter Alexander. Device for holding skis. 3,620,543, Cl. 280-11.13
Peisach, Joel M., to Polaroid Corporation. Novel processes for forming two negative color transfer images. 3,620,731, Cl. 96-3.
Pekarek, Edward G.: *See—*
Wheaton, Harold L.; and Pekarek, Edward G., 3,620,719.
Pelleschi, Charles A.: *See—*
Pelleschi, Joe; and Pelleschi, Charles A., 3,620,461.
Pelleschi, Joe; and Pelleschi, Charles A. Portable shredder for classified documents. 3,620,461, Cl. 241-100.
Pelorex Corporation: *See—*
Rait, Joseph M., 3,620,425.
Penn, Edward Michael. Data processing magnetic tape cartridge. 3,620,475, Cl. 242-197.
Penn, Edward Michael. Data processing tape ring cartridge. 3,620,477, Cl. 242-197.
P.E.P. Inventions Inc.: *See—*
Page, William R., 3,620,541.
Pepino, George T., Jr.: *See—*
Sama, Lawrence; and Pepino, George T., Jr., 3,620,693.
Perkin-Elmer Limited: *See—*
Turner, David W., 3,621,241.
Perkins, Albert G., to Perkins Pipe Linings, Inc. Trowel for pipe lining material. 3,619,873, Cl. 25-38.
Perkins, Earl Stuart: *See—*
Hobbs, James; Perkins, Earl Stuart; and Floyd, Donald E., 3,621,212.
Perkins, Earl Stuart, to Butler National Corporation. Automatic track. 3,621,211, Cl. 235-150.27

Perkins, James F.: *See—*
Cason, Charles M., III; and Perkins, James F.,3,621,461.
Perkins Pipe Linings, Inc.: *See—*
Perkins, Albert G., 3,619,873.
Perlman, Marvin: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,621,228.
Perreault, Henry W.; and Scharfman, Howard, to Raytheon Company. Microwave energy phase shifter. 3,621,481, Cl. 333-31.
Perry, Charles B.; and Horlacher, Herman, to Cincinnati Milling Machine Company, The. Machine tool. 3,619,898, Cl. 29-568.
Perucca, Giovanni, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Electronically controlled cross-bar-switch. 3,621,147, Cl. 179-18.
Pet Incorporated: *See—*
Watkins, Harley E., 3,620,764.
Peters, Henning; and Solmecke, Klaus-Dieter, to Uhde, Friedrich, GmbH. Closure system for high-pressure vessels. 3,620,405, Cl. 220-40.
Peters, Theodore F., to General Motors Corporation. Vehicle closure latch. 3,620,560, Cl. 292-201.
Peters, Wendell R., to United States of America, Air Force. Digital thermometer. 3,620,082, Cl. 73-362.
Petersen, Frederick A., Jr.: *See—*
Mercer, Francis T.; and Petersen, Frederick A., Jr.,3,620,538.
Petersen, Povl V.; Hansen, Villy H.; and Hjortkjaer, Jes, to Kefalas A/S. Antidepressant composition and method of treating depression. 3,621,101, Cl. 424-330.
Peterson, Clifford Dean. Universal drive apparatus. 3,620,322, Cl. 180-51.
Peterson, Donald T., to Riegel Paper Corporation. Sealing unit for sealing gusset bottom bags. 3,620,884, Cl. 156-553.
Peterson, Marvin A., to Beatrice Foods Co. Marshmallow composition. 3,620,769, Cl. 99-134.
Peterson, Noel C.; and Klein, Gerald I., to Westinghouse Electric Corporation. Apparatus for dissipating wave energy. 3,621,479, Cl. 333-22.
Peterson, Victor S., to United States of America, National Aeronautics and Space Administration. Solid state remote circuit selector switch. 3,621,287, Cl. 307-241.
Petkovsek, John M.; and Rodriguez, Carlos O., to International Minerals & Chemical Corporation. Granulation of potassium sulphate. 3,620,709, Cl. 71-63.
Petro-Tex Chemical Corporation: *See—*
Tschopp, Lloyd D.; and Woerner, Rudolph C., 3,620,930.
Peyrot, Jean-Pierre. Rotary welding gun. 3,621,182, Cl. 219-125.
Pfann, William G., to Bell Telephone Laboratories, Incorporated. Method for solidifying while rubbing the solid- liquid interface. 3,620,686, Cl. 23-295.
Pfefferle, William C., to Atlantic Richfield Company, mesne. Process. 3,620,962, Cl. 208-89.
Pfister, Paul: *See—*
Racht, Willis J.; and Pfister, Paul,3,621,442.
Pharr Yarns, Incorporated: *See—*
Gates, Terry Lee, 3,619,875.
Philipps, Virgil, to Federal Auto Products Co., Inc. Dispensing unit for sealed pressurized containers. 3,620,414, Cl. 222-5.
Phillips Mine & Mill Supply Co.: *See—*
Miller, Robert G.; and Radaker, Ernest H., 3,620,549.
Phillips Petroleum Company: *See—*
Cleary, James W., 3,621,075.
Gilbert, Dixie E., 3,619,857.
Hatcher, Charles S.; and Teague, Charles H., 3,621,088.
Rogers, Ronald S.; and Proctor, Oliver P., 3,620,685.
Ruehlen, Forrest N., 3,620,941.
Phipps, Charles M., Jr., to United Aircraft Corporation. Method for casting directionally solified articles. 3,620,289, Cl. 164-60.
Piechota, Helmut: *See—*
Diehr, Hans Joachim; Merten, Rudolf; Piechota, Helmut; and Uhlig, Konrad,3,620,986.
Pierce, George W. Locking link. 3,620,563, Cl. 294-82.
Pierce, John B.: *See—*
Symons, Robert C.; Koch, Stanley H.; and Pierce, John B.,3,620,394.
Pierce, Odgen R.: *See—*
Kim, Yung Ki; and Pierce, Odgen R.,3,620,992.
Pierce, Perry J., Jr.: *See—*
Martin, James S.; Leek, Wayne E.; Pierce, Perry J., Jr.; and Larson, Earl G.,3,619,925.
Pignolet, Louis W., to Weston Instruments, Inc. Compact moving coil meter movement. 3,621,393, Cl. 324-150.
Pilkington Perkin-Elmer Limited: *See—*
Freeman, Michael Harold, 3,620,592.
Pillsbury Company, The: *See—*
Hans, Richard G., 3,620,763.
Pitchon, Esra: *See—*
Friedman, Herman H.; Pitchon, Esra; Cascione, Alexander S.; and Banks, Burton L.,3,620,758.
Pitney Bowes-Alpex, Inc.: *See—*
Berler, Robert M., 3,621,265.
Pitney-Bowes, Inc.: *See—*
Scribner, Albert W., 3,621,206.
Place, Donald E., to Therm-O-Disc, Incorporated. Protector shields for thermostats. 3,621,197, Cl. 219-328.
Plessey BTR Limited: *See—*
Davis, John Christopher Hammond; and Leathers, John William, 3,620,087.
Plond, Gabriel, to Thomson-CSF. Triggered pulse generator. 3,621,274, Cl. 307-106.
Plumbar, Oliver, to Gulf Oil Corporation. Breaking refinery sewer oil and water emulsions with sodium bicarbonate. 3,620,971, Cl. 210-59.
Poerink, Jannes Jonge. Wire mesh conveyor belt. 3,620,356, Cl. 198-193.
Pohland, Albert: *See—*
Kwok, Russell; and Pohland, Albert,3,621,041.
Pohler, Alfred, to Schwarzkopf Development Corporation. Electrically heated chair. 3,621,192, Cl. 219-217.
Polaroid Corporation: *See—*
Bailey, James L.; and Rodgers, Franklin A., 3,620,895.
Burgarella, John P., 3,620,143.
Buzzell, Harold O., 3,620,888.
Cook, Russel P., 3,620,730.
Land, Edwin H., 3,620,724.
Peisach, Joel M., 3,620,731.
Polishuk, Arthur T., to Sun Oil Company. Mixed complex aluminum soap-clay grease composition. 3,620,975, Cl. 252-21.
Polistina, Rocco Albert: *See—*
Schmitt, Edward Emil; and Polistina, Rocco Albert,3,620,218.
Polivka, John N.: *See—*
Wenger, Jerry A.; Douglas, Daryl D.; Urch, Harvey M.; Nordman, Leonard; and Polivka, John N.,3,620,564.
Poot, Albert Lucien, to Gevaert-Agfa N.V. Thermodiazo type copying. 3,620,740, Cl. 96-49.
Poot, Albert Lucien; and Van Brandt, Rene Alois, to Gevaert-Agfa N.V. Diazotype copying. 3,620,741, Cl. 96-49.
Porret, Daniel; Batzer, Hans; Schmid, Rolf; and Ruf, Peter, to Ciba Limited. β-Methyglycidyl-isocyanurates. 3,620,983, Cl. 260-2.
Porsche, Dr.-Ing. H.c.F., K.G., Firma: *See—*
Stotz, Erich, 3,620,099.
Porta, Paolo della; Giorgi, Tiziano A.; Kindl, Bruno Milan; and Zucchinelli, Mario, to S.A.E.S. Getters S.p.A. Getter device. 3,620,645, Cl. 417-48.
Portnoy, William M.; and Leedy, Hayden M., Jr. Titanium-silicon rectifying junction. 3,621,344, Cl. 317-234.
Posey, Ken, Jr., to United States of America, Navy. Method for removing dissolved oxygen from hydrocarbon gels. 3,620,694, Cl. 44-7.
Poshkus, Algirdas C., to Armstrong Cork Company. Method of preparing anhydrous phosphorus acid. 3,620,672, Cl. 23-165.
Post Office, The: *See—*
Brownlie, John David, 3,621,480.
Finn, Frederick George; and Gaut, Charles John, 3,619,829.
Griffiths, John Michael, 3,621,140.
Powerlock Floors, Inc.: *See—*
Omholt, Ray E., 3,619,963.
Prange, Arthur J., Jr.; Wilson, Ian C.; and Lipton, Morris A., to University of North Carolina, The. Antidepressant method and composition for same comprising a tricyclic antidepressant and a thyroid hormone. 3,621,096, Cl. 424-244.
Prasse, Herbert F., to Ramsey Corporation. Piston sleeve. 3,620,137, Cl. 92-169.
Prentice, James B., to Procter & Gamble Company, The. Oligomeric ester chain condensates of ethane-1- hydroxy-1,1-diphosphonic acid. 3,621,081, Cl. 260-924.
Prescott, Bernard Clark, to Universal Coin Meter Company, Inc. Mechanical rotary coin acceptor. 3,620,342, Cl. 194-61.
Preston, Jack: *See—*
De Winter, Walter F.; and Preston, Jack,3,621,076.
Prete, Ernest, Jr.: *See—*
Brenia, Paul S.; and Prete, Ernest, Jr.,3,620,171.
Prevett, Peter Dominec; and Morin, Theodore Joseph, to Industrial Magnetics, Inc. Continuous welding. 3,621,175, Cl. 219-9.5
Prevorsek, Dusan C.: *See—*
Li, Hsin Lang; Prevorsek, Dusan C.; and Oswald, Hendrikus Johan,3,619,874.
Price, Glenn R., to Stauffer Chemical Company. Process for preparation of phosphorus containing compounds. 3,621,083, Cl. 260-968.
Price, Ralph E., to Litton Industries, Inc. Self-aligning rack for traversing member. 3,619,950, Cl. 51-95.
Pricer, Wilbur David, to International Business Machines Corporation. Monolithic integrated semiconductor array having reduced power consumption. 3,621,302, Cl. 307-291.
Pricer, Wilbur D.: *See—*
Jen, Teh-Sen; Pricer, Wilbur D.; and Vogl, Norbert G., Jr.,3,621,279.
Priestland, Colin Richard Douglas: *See—*
Emery, John Arthur Alfred; Jackson, Geoffrey Norman; and Priestland, Colin Richard Douglas,3,620,957.
Princiotta, Frank T.; and Barr, Harold N., to United States of America, Atomic Energy Commission. radioisotope fuel capsule. 3,621,261, Cl. 250-106.
Pringle, Frank E.; Wilson, David A.; and Cochrane, Richard H., to Hayssen Manufacturing Company. Packaging apparatus. 3,619,972, Cl. 53-51.
Printing Developments, Inc.: *See—*
Heynisch, Hinrich; Bittorf, Hannjorg; and Veith, Werner, 3,621,319.

Procter & Gamble Company, The: *See—*
Gellert, Dale A., 3,620,217.
Lanner, Arthur W., 3,620,665.
Prentice, James B., 3,621,081.
Strobel, Rudolf G. K.; and Artman, Neil R., 3,620,756.

Proctor & Gamble Company, The: *See—*
Conklin, Edward J., 3,620,712.

Proctor, Oliver P.: *See—*
Rogers, Ronald S.; and Proctor, Oliver P.,3,620,685.

Proctor-Silex Incorporated: *See—*
Rideout, Gerald E.; and Walker, Clifford R., 3,619,850.

Prokell, John L., to Mesta Machine Company. Mill unjamming device. 3,620,062, Cl. 72-248.

Propst, Robert L. Tree harvesting apparatus. 3,620,273, Cl. 144-3.00d

Protective Packaging, Inc.: *See—*
Crane, Walton B.; and Hawkinson, John, 3,620,175.

Pruitt, Jackson L. Stereo pillow. 3,621,155, Cl. 179-146.

Pullman Incorporated: *See—*
Heffner, George R., 3,620,864.

Pulsepower Systems Incorporated: *See—*
Elmore, Lester C.; and Broxholm, Thomas M., 3,620,313.

Pulvari, Charles F.; and Urban, Stephen F., said Urban assor. to NL Industries, Inc. Polar vapor sensing means. 3,621,343, Cl. 317-231.

Purcell, John R., to United States of America, Atomic Energy Commission. Method of determining bonding in a composite superconductor. 3,621,386, Cl. 324-64.

Pyro-Werke GmbH: *See—*
Friedrichs, Ruth, 3,620,845.

Quaker Chemical Corporation: *See—*
Kress, Bernard H.; and Alexander, Donald E., 3,620,290.

Quantronix Corporation: *See—*
Daly, Richard T.; and Vambutas, Edmundas, 3,620,626.

Query, Joseph O. Magnetic engine. 3,621,424, Cl. 335-306.

Quick, Graeme R.; and Brandini, Adhemar, to Iowa State University Research Foundation. Vibrating concave for a combine. 3,620,224, Cl. 130-27.

Quvoe Chemical Industries: *See—*
Gulick, Graham L., 3,620,967.

Rabow, Gerald; and Klein, Albert M., to International Telephone and Telegraph Corporation. Synchronization system for a synchronous receiver. 3,621,399, Cl. 325-321.

Rachlin, Stanley, to International Flavors & Fragrances Inc. Process for preparing isocaryophyllene. 3,621,070, Cl. 260-675.5

Racht, Willis J.; and Pfister, Paul, to Allen-Bradley Company. Terminal connection of electronic devices. 3,621,442, Cl. 338-309.

Rachwal, Ervin J.; Marculewicz, Robert W.; and Campbell, Douglas B., to Matrographics, Inc., mesne. Emulsion control. 3,620,621, Cl. 355-30.

Radaker, Ernest H.: *See—*
Miller, Robert G.; and Radaker, Ernest H.,3,620,549.

Radscheit, Kurt: *See—*
Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Stache, Ulrich,3,621,015.
Stache, Ulrich; Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Schroder, Hans-Georg,3,621,014.

Raether, Wolfgang: *See—*
Winkelmann, Ehardt; and Raether, Wolfgang,3,621,013.

Railtec Corporation: *See—*
Murdock, Robert H., 3,620,505.

Rait, Joseph M., to Pelorex Corporation, mesne. Aerosol valve actuator. 3,620,425, Cl. 222-518.

Raley, John H.: *See—*
Magoon, Eugene F.; Cannell, Lawrence G.; and Raley, John H.,3,620,981.

Ralston Purina Company: *See—*
Spring, Ferdinand E., Jr., 3,620,761.
Ver Steeg, Melvin A., Jr.; and Spring, Ferdinand E., Jr., 3,620,760.

Ramco Incorporated: *See—*
Young, Clyde L., 3,620,037.

Ramseier, Paul, to Bracker AG. Apparatus for forming closing heads at rivets. 3,620,060, Cl. 72-112.

Ramsey Corporation: *See—*
Prasse, Herbert F., 3,620,137.

Randall, James C.: *See—*
Slade, Philip E.; Estes, Robert T.; and Randall, James C.,3,620,824.

Rapeaud, Michel. Double-walled container. 3,620,399, Cl. 215-13.

Rath, Albert, to Eastern Steel Products Ltd. Dual purpose vehicle. 3,620,458, Cl. 239-657.

Rauenbusch, Erich: *See—*
Wagner, Otto; Bauer, Klaus; Kaufmann, Wilfried; Rauenbusch, Erich; Arens, Alfred; and Irion, Eckart,3,620,926.

Rausch, John J.; and Van Thyne, Ray J. Method of diffusion coating metal substrates using molten lead as transport medium. 3,620,816, Cl. 117-114.

Rauterkus, Karl Josef: *See—*
Steppan, Hartmut; Rauterkus, Karl Josef; and Seip, Detlev,3,620,732.

Raven Electronics Corporation: *See—*
Raven, Richard C.; and Moser, Leonard M., 3,621,307.

Raven, Richard C.; and Moser, Leonard M., to Raven Electronics Corporation. Touch responsive control circuit. 3,621,307, Cl. 307-308.

Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Field, Stanely, to National Starch and Chemical Corpoation. Electrophotographic coating compositions employing styrene terpolymers as binders. 3,620,729, Cl. 96-1.8

Ray, Kay M., Mrs.: *See—*
Martin, Carl, 3,620,805.

Ray, Robert C., to Bell & Howell Company. Self-loading take-up reel. 3,620,474, Cl. 242-195.

Raychem Corporation: *See—*
Evans, Joseph H.; and Weir, Fred Eugene, 3,620,406.

Raymond Control Systems, Inc.: *See—*
Clark, Malcolm D., 3,621,172.

Raymond Engineering, Inc.: *See—*
Stone, Robert L., 3,620,473.

Raynor, Gilbert S., to United States of America, Atomic Energy Commission. Swing shield for roto-slide sampler. 3,620,078, Cl. 73-170.

Raytheon Company: *See—*
Bennett, Harold W.; and Richards, Barry E., 3,619,884.
Hergenrother, Rudolf C., 3,620,630.
Perreault, Henry W.; and Scharfman, Howard, 3,621,481.

RCA Corporation: *See—*
Christensen, Don Edward, 3,621,487.
Dean, Jack Allen, 3,621,297.
Franklin, David Louis; and Balents, Leon Martin, 3,620,692.
Hammer, Jacob Meyer; and Vural, Bayram, 3,621,462.
Hoelscher, Max W.; and Strubhar, Paul D., 3,620,799.
Isom, Warren Rex, 3,620,467.
Rosen, Arye; and Mykietyn, Edward, 3,621,367.
Wittlinger, Harold Allen, 3,621,226.

Reagan, Donald W.: *See—*
Mishcon, Lester; and Reagan, Donald W.,3,620,049.

Reams, Robert B., Jr.; and Klute, Charles H., to United States of America, Army. Optical system for intermixing dissimilar step- and-repeat patterns. 3,620,623, Cl. 355-53.

Reaves, Vernon R.: *See—*
Van Arsdale, Lyle R.; Lathrop, Francis M.; and Reaves, Vernon R.,3,620,236.

Reese, Glenn A.: *See—*
Crane, Paul J.; and Reese, Glenn A.,3,621,201.

Reese, Julian: *See—*
Harris, William M.; and Reese, Julian,3,619,830.

Reeves, Goodwyn George. Broad band laser amplifier. 3,621,459, Cl. 331-94.5

Ref, Josef; and Finhill, Mort, to TRW Semiconductors, Inc. Lead frame configuration. 3,621,114, Cl. 174-52.

Regensburger, Paul J., to Xerox Corporation. Method of using a xeroradio-graphic plate which insensitive to visible light. 3,621,248, Cl. 250-65.

Regie Nationale des Usines Renault: *See—*
De Coye de Castelet, Gaetan, 3,620,936.
Leconte, Jacky, 3,620,566.

Rehmet, Manfred; and Begemann, Jurgen, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. High pressure compact arc lamp with electrodes containing tantalum carbide. 3,621,322, Cl. 313-184.

Reichel, Bernd: *See—*
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; Jeserich, Wolfgang-Dieter; and Reichel, Bernd,3,621,001.

Reichelt, Bernhard; and Winter, Richard, to Conradty, C. Sectional cutting or welding electrode. 3,621,187, Cl. 219-145.

Reichert, Donald G.: *See—*
Neal, Morris P.; Reichert, Donald G.; and Fradenburgh, John,3,620,138.

Reichner, Philip, to Westinghouse Electric Corporation. Gas analysis method. 3,620,931, Cl. 204-1.00t

Rein, Walter: *See—*
Siggel, Erhard; Rein, Walter; and Caesar, Horst-Manfred,3,621,074.

Reiners, Walter: *See—*
Furst, Stefan, 3,620,048.

Reinhardt, Gerd; Heide, Horst; and Flinspach, Sebastian, to Audi NSU Auto Union Aktiengesellschaft. Carburetor system for combustion engines. 3,620,511, Cl. 261-41.

Remington Arms Company, Inc.: *See—*
Alday, James M., 3,619,926.
Martin, James S.; Leek, Wayne E.; Pierce, Perry J., Jr.; and Larson, Earl G., 3,619,925.
Martin, James S.; and Morse, Charles H., 3,619,928.

Renault, Philippe; Falcon, Serge; Chavin, Jean-Claude; and Deschamps, Andre, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for regenerating volatile bases and volatile acids from the salts formed therewith. 3,620,674, Cl. 23-178.

Renner, Otto, to Licentia Patent-Verwaltungs-G.m.b.H. Spraying apparatus. 3,620,190, Cl. 118-630.

Republic Corporation: *See—*
Holland, Harold, 3,620,057.

Resch, Richard J.: *See—*
Hendrickson, Philip J.; and Resch, Richard J.,3,620,567.

Research Corporation: *See—*
Marvel, Carl S., 3,620,997.
Marvel, Carl S., 3,620,999.
Van Damme, Frans M., 3,620,707.

Reti, Adrian R.: *See—*
Ehrreich, John E.; and Reti, Adrian R.,3,620,873.

Rey, Henri. Device for coupling a ski-bob to a ski-lift. 3,620,168, Cl. 104-202.
Reynolds, Blake; and Ludeman, Clifford G., to Texaco Development Corporation. Reducing gas generation. 3,620,699, Cl. 48-212.
Reynolds Metals Company: *See—*
Singleton, Ogle R., Jr.; Kesler, Sidney B., Jr.; and Warren, William E., 3,620,516.
Reyx, Philippe, to Merlin Gerin, Societe Anonyme. Linear induction motor system for sliding door panel movement control. 3,621,349, Cl. 318-138.
RFD, Inc.: *See—*
Beaty, Charles A., 3,621,465.
Rheinmetall GmbH: *See—*
Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried, 3,620,167.
Rhodenizer, Harold L.: *See—*
Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S.,3,620,933.
Rhone-Poulenc S.A.: *See—*
Farge, Daniel; Moutonnier, Claude; and Messer, Mayer Naoum, 3,621,037.
Riblett, Harry C., Jr., to All American Industries, Inc. Runway sheave assembly for aircraft arresting gear. 3,620,489, Cl. 244-110.
Ricards, Charles L., to Wood Industries, Inc. Automatic stereotype plate casting and finishing machine. 3,620,292, Cl. 164-140.
Riccar Swing Machine Co., Ltd.: *See—*
Kuwajima, Hideki, 3,620,179.
Rice, Edward J.: *See—*
Crishal, Joan M.; and Rice, Edward J.,3,620,932.
Richards, Barry E.: *See—*
Bennett, Harold W.; and Richards, Barry E.,3,619,884.
Richardson Company, The: *See—*
Wentland, Robert J., 3,620,402.
Richardson, Howe Scale Company: *See—*
Burke, Arthur J.; and Keller, Rudolf, 3,619,981.
Richey, Clarence B., to Massey-Ferguson Inc. Implement spring cushion. 3,620,310, Cl. 172-600.
Richter, Ferdinand Joseph; and Messer, Philip Joseph, to American Cyanamid Company. Sponges with dry impregnants. 3,619,843, Cl. 15-104.93
Richter, Wolfgang, to Lehmann, Ernst Paul. Model railway track. 3,620,451, Cl. 238-10.00e
Ricoh Co., Ltd.: *See—*
Kawazu, Motoaki, 3,620,602.
Rideout, Gerald E.; and Walker, Clifford R., to Proctor-Silex Incorporated. Vacuum cleaner. 3,619,850, Cl. 15-323.
Ridgway, James S., to Monsanto Company. Transparent fiber forming copolyamides. 3,621,002, Cl. 260-78.
Riedel, Anton; and Nissl, Max, to Agfa-Gevaert Aktiengesellschaft. Device for attaching a flexible strip to a reel for winding thereon. 3,620,469, Cl. 242-74.
Riedel, Dieter, to Drabert Sohne. Textile decatising apparatus. 3,620,051, Cl. 68-8.
Riegel Paper Corporation: *See—*
Johnson, Kenneth R.; Tyson, W. Gerald; and Soroka, Joe F., 3,619,975.
Peterson, Donald T., 3,620,884.
Rieschel, Hartmut, to Maschinenfabrik Koppern & Co. K.G. Apparatus for briquetting bulk materials on roller presses. 3,620,157, Cl. 100-145.
Riester, Oskar, to Agfa-Gevaert Aktiengesellschaft. Direct positive silver halide emulsions containing thallium salt and mercury salt. 3,620,750, Cl. 96-108.
Riester, William C.: *See—*
Papadatos, Dionysios D.; Deibel, Raymond A.; and Riester, William C.,3,619,847.
Riggs, Emmet D., to Atlantic Richfield Company. Optical processing of data. 3,620,591, Cl. 350-6.
Ringwall, Carl G.; and Bottone, Salvatore, Jr., to General Electric Company. Electro-fluidic delay line oscillator. 3,621,453, Cl. 331-64.
Rinker, Richard: *See—*
Beermann, Paul; and Grosse-Benne, Willi, 3,619,930.
Robbins, Burnell N., to Honeywell Inc. Control wheel force steering apparatus. 3,620,073, Cl. 73-133.
Robbins, Daniel T. Envelope. 3,620,441, Cl. 229-85.
Roberts, Arthur A.: *See—*
Leff, Jerry; and Roberts, Arthur A.,3,620,837.
Roberts Company: *See—*
Grishin, Peter F., 3,620,002.
Roberts, Francis Eugene. Cable hanger. 3,620,490, Cl. 248-58.
Roberts, James F.: *See—*
Clark, Conrad A.; Dumbri, Austin C.; and Roberts, James F.,3,620,814.
Roberts, Richard W., to Borg-Warner Corporation. Hydrostatic transmission mechanism. 3,620,130, Cl. 91-506.
Robertshaw Controls Company: *See—*
Fox, Raymond J., 3,620,659.
Nisley, Larry V., 3,620,244.
Thompson, Edwin A., 3,620,849.
Robinet, Jean, to Etablissement Ruggieri. Manually-controlled firing means. 3,619,927, Cl. 42-1.
Robinson, Edgar C., to Bickenson's Ltd. Burners. 3,620,657, Cl. 431-9.
Robinson Waxed Paper Company, Limited, The: *See—*
Backwell, Terence Frank, 3,620,872.
Robinson, William H. Apparatus for orienting closure caps and the like. 3,619,982, Cl. 53-314.
Rocheleau, Antoni A., to Industrial Nucleonics Corporation. Headbox jet velocity measuring system and method. 3,620,914, Cl. 162-198.
Rochelle, William R.: *See—*
Ward, Delbert R.; and Rochelle, William R.,3,620,554.
Rockstroh, Manfred: *See—*
Topfer, Heinz; and Rockstroh, Manfred,3,620,252.
Rockwell Manufacturing Company: *See—*
Lawson, Richard L., 3,620,502.
Rockwell, Thomas D. Insert retainer for retaining pencils, pens, and the like. 3,619,817, Cl. 2-250.
Rodgers, Franklin A.: *See—*
Bailey, James L.; and Rodgers, Franklin A.,3,620,895.
Rodriguez, Carlos O.: *See—*
Petkovsek, John M.; and Rodriguez, Carlos O.,3,620,709.
Roeschlaub, Ronald C., to Irontite Products Co. Inc. Method of replacing defective spark plug hole threads. 3,619,892, Cl. 29-401.
Rogers, Bryant C.; and Wakely, Wilbur T., to Fairchild Camera and Instrument Corporation. Diaphragm-connected, leadless package for semiconductor devices. 3,621,338, Cl. 317-101.
Rogers, James H.; and Dunn, William G. Noise abatement methods relating to flame and jet production and associated apparatus. 3,620,013, Cl. 60-39.72
Rogers, Ronald S.; and Proctor, Oliver P., to Phillips Petroleum Company. Radial flow catalyst reactor. 3,620,685, Cl. 23-288.
Rogge, Joachim: *See—*
Wehde, Heinz; Schindler, Kurt; Rogge, Joachim; and Czinczel, Armin,3,620,576.
Rohde, William E. Manually directed cotton harvesting machine. 3,619,994, Cl. 56-13.1
Rohm and Haas Company: *See—*
Kelley, Louis E.; Alexander, Raymond B.; and Sioma, Edward M., 3,620,071.
Rohr, Fred W., to P & W Engineers, Inc. Suppression of the steam plume from incinerator stacks. 3,619,983, Cl.
Rohr, Fred W., to P & W Engineers, Inc. Method for treating heated gases to suppress steam plume formation. 3,619,985, Cl. 55-89.
Rolff, William, to Singer Company, The. System for correcting unbalances on a rotating mass. 3,621,180, Cl. 219-121.
Rolla-Mount Joint Venture, The: *See—*
Goldstein, Paul, 3,621,195.
Rolls Royce Limited: *See—*
Lawrie, Brian Wilfred, 3,620,021.
Rolls-Ramo Limited: *See—*
Wilde, Geoffrey Light, 3,620,012.
Rolls-Royce Limited: *See—*
Beale, Richard D., 3,620,022.
Halliwell, David George; Outram, Michael Vaughan; and Bryan-Brown, Martin Hume, 3,620,020.
Jones, John Windsor, 3,620,643.
Keen, John Michael Storer; Byett, Maurice John; and Weston, Francis Anthony, 3,620,641.
Sharples, John, 3,620,656.
Wilde, Geoffrey Light, 3,620,009.
Roman, Vernon A. Gas washer. 3,620,509, Cl. 261-18.
Rombeck, Henry E., to Textron Inc. Automatic tracer valve. 3,620,499, Cl. 251-3.
Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried, to Rheinmetall GmbH. Drive cage for wing stabilized low caliber sheets. 3,620,167, Cl. 102-93.
Romney, Gordon W.; Evans, David C.; Erdahl, Alan C.; Wylie, Chris R., deceased; and Wylie, Patricia A.; administratrix. Electronically-generated perspective images. 3,621,214, Cl. 235-151.
Ronnevig, Carl: *See—*
Dalmo, Bror; Franked, John; Landhult, Hans; Nordberg, Birger; Ronnevig, Carl; and Tjernstrom, Ove,3,621,315.
Ronson Corporation: *See—*
Schlamp, Herman, 3,620,661.
Root, Roland L.; and Eilers, Louis H., to Dow Chemical Company, The. Alum containing aluminous cements. 3,620,785, Cl. 106-104.
Rorden, Robert J.; Dowley, Mark W.; and Mefferd, Wayne S., to Coherent Radiation. Optical second harmonic generator. 3,621,273, Cl. 307-88.3
Rose, James S.: *See—*
McLaughlin, Alexander M.; and Rose, James S.,3,620,987.
Rose, John: *See—*
Daker, Horace Herbert; Martin, Raymond Alfred; and Rose, John,3,620,001.
Rose, LeRoy: *See—*
Hood, Larry H.; Rose, LeRoy; and Starks, Charles M.,3,620,189.
Rosen, Arye; and Mykietyn, Edward, to RCA Corporation. Frequency multiplier employing input and output strip transmission lines without spatially coupling therebetween. 3,621,367, Cl. 321-69.
Rosenbaum, Milton. Storage chest for silverware or the like. 3,620,409, Cl. 220-85.
Rosensweig, Ronald E., to Ferrofluidics Corporation. Magnetic fluid seals. 3,620,584, Cl. 308-187.1
Rosin, Jacob, to Chris-Craft Industries, Inc. Production of 5-chlorosalicylaldehyde. 3,621,064, Cl. 260-600.
Rosinski, Edward J., to Mobil Oil Corporation. Explosive fragmentation of porous solids. 3,620,965, Cl. 208-120.
Ross, Gray E. D., to Zenith Carburetter Company Limited, The. Fuel supply devices for cold starting of internal combustion engines. 3,620,202, Cl. 123-179.

Ross, John M.; and Stryker, Harvey I., to Du Pont de Nemours, E. I., and Company. Direct disazo and tetraazo urea dyes and method of preparation. 3,621,008, Cl. 260-175.

Ross, Keith, to Davy and United Engineering Company Limited. Article shaping or forming machines. 3,620,067, Cl. 72-407.

Ross, Lester M.: *See—*
Yates, Robert E.; and Ross, Lester M.,3,619,906.

Ross, Ned: *See—*
Passaro, Frank; Ross, Ned; and Mondry, Leo,3,619,964.

Ross, Robert H.; Larko, Robert C.; and Swartzfager, Walter G., to Sunbeam Equipment Corporation. Furnace heating control system. 3,620,520, Cl. 263-40.

Ross, Robert S.: *See—*
Charpentier, Jean F.; and Ross, Robert S.,3,620,486.

Rossmann, Winfried: *See—*
Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried,3,620,167.

Rothwarf, Frederick, to United States of America, Army. Superconducting frequency converter system. 3,621,472, Cl. 332-20.

Rotzsche, Harald: *See—*
Muller, Richard; Irmisch, Reiner; and Rotzsche, Harald,3,621,045.

Rouse, Paul B.: *See—*
Wood, Robert; and Rouse, Paul B.,3,620,438.

Rousseau, Claude, to C.I.T.-Compagnie Industrielle des Telecommunications. Monostable device having a high time constant with shortened reuse time. 3,621,298, Cl. 307-273.

Royal Seating Corporation: *See—*
Jennings, Roy E., 3,620,492.

Rubel, Hartmut, to Siemens-Aktiengesellschaft. Zirconium structure. 3,620,691, Cl. 29-191.

Rubner, Tibor; Wavre, Andre; and Bednarek, John H., to Westinghouse Electric Corporation. Automatic generator synchronizing and connecting system and synchronizer apparatus for use therein. 3,621,278, Cl. 307-216.

Rueger, William J.: *See—*
Baumann, Gerald W.; Norwood, Richard E.; and Rueger, William J.,3,620,430.
Fitzgerald, Richard J.; Jacobsen, Ronald R.; and Rueger, William J.,3,620,478.

Ruehlen, Forrest N., to Phillips Petroleum Company. Electrochemical fluorination of 1,2-dichloroethane and 1,1,2-trichloroethane. 3,620,941, Cl. 204-59.

Ruf, Peter: *See—*
Porret, Daniel; Batzer, Hans; Schmid, Rolf; and Ruf, Peter,3,620,983.

Rump, John H., to Monsanto Company. Plastic food container. 3,620,403, Cl. 220-4.

Rump, John H., to Monsanto Company. Plastic food container. 3,620,411, Cl. 220-315.

Rusch, William T., to Sanders Associates, Inc. Manual vibrato for stringed instruments. 3,620,117, Cl. 84-313.

Rush, David H.; and Williams, Wayne E., to Eastern Air Lines Inc., mesne. Lighting system for folded inflatable escape slides with means for testing system with slide in folded condition. 3,621,383, Cl. 324-51.

Russell, David J. Stay adjuster. 3,620,182, Cl. 114-109.

Russell, George F.; and McWain, Richard. Golf club washer. 3,619,841, Cl. 15-210.

Russell, Peter B.; Alburn, Harvey E.; and Grant, Norman H., to American Home Products Corporation. 6-(2-Amino-hexahydro-2-indancarboxyamido) and 6- (1,2,3,4,5,6,7,8,9,10-decahydronaphthalene-2-amino- 2-carboxamido) penicillanic acids. 3,621,011, Cl. 260-239.1

Russell, Robert Francis: *See—*
Parkinson, Norman; Blakely, Christine Mary; and Russell, Robert Francis,3,620,366.

Rust, Robert: *See—*
Dijksterhuis, Popko Reinder; and Rust, Robert,3,620,958.

Ruth, Arthur P. Timed material dispensing mechanism utilizing accumulation of a liquid. 3,620,415, Cl. 222-57.

Ruytenbeek, Silvester Marie: *See—*
Geominy, Louis Joseph Henri; Gommans, Hubertus Johannes Josephus; Mans, Leonardus Frans Helene; and Ruytenbeek, Silvester Marie,3,621,203.

Ryan, Joseph Henry, Jr.: *See—*
Harris, Roland G.; and Ryan, Joseph Henry, Jr.,3,620,898.

Ryder, Francis E., to Seymour of Sycamore, Inc., mesne. Injection pump assembly for aerosol containers. 3,620,266, Cl. 141-20.

Ryder, Frederick L. Capacitance type fluid measuring apparatus. 3,620,080, Cl. 73-304.

Ryerson, Joseph T., & Son, Inc.: *See—*
Brinkema, Robert J., 3,620,374.

Sabatini, Bruno; and Yeomans, Kenneth A., to British Iron and Steel Research Association, The. Hot or cold rolling of strip or plate. 3,620,058, Cl. 72-8.

Sabo, Roland S.: *See—*
Szeluga, Ludwick; Hoffman, Ernest G.; and Sabo, Roland S.,3,620,447.

Sackett, Alma R. Baby shower-bath and play tub. 3,619,823, Cl. 4-148.

Saeki, Toyoaki: *See—*
Kikuchi, Makoto; and Saeki, Toyoaki,3,619,951.

S.A.E.S. Getters S.p.A.: *See—*
Porta, Paolo della; Giorgi, Tiziano A.; Kindl, Bruno Milan; and Zucchinelli, Mario, 3,620,645.

Sagara, Takaaki: *See—*
Yoshida, Teruo; Sagara, Takaaki; Ojima, Takashi; Takahashi, Reiji; and Takahashi, Masahiro,3,620,762.

Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi, to Mitsubishi Rayon Co., Ltd., and Mitsubishi Acetate Co., Ltd. Tobacco smoke filter. 3,620,227, Cl. 131-267.

Saito, Chiharu: *See—*
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira,3,621,043.

Saito, Masatosi: *See—*
Watanabe, Yoshihiro; Kobayashi, Jiro; Toyoshima, Yoshiki; Tokumaru, Toor; and Saito, Masatosi,3,621,072.

Sakai, Hiroshi: *See—*
Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio,3,621,087.

Sakai, Kiyoshi: *See—*
Kubo, Keishi; and Sakai, Kiyoshi,3,620,160.

Salsbury Laboratories: *See—*
Berndt, Edward W.; and Vatne, Robert D., 3,621,095.

Salvadore, William E.: *See—*
Hertz, Jerome J.; and Salvadore, William E.,3,621,091.

Salzmann, Alfred M. Appliance for cleaning floors. 3,619,848, Cl. 15-320.

Sama, Lawrence; and Pepino, George T., Jr., to GTE Electric Incorporated. Ductile, high temperature oxidation-resistant composites and processes for producing same. 3,620,693, Cl. 29-195.

Sammet, William Reinbolt. Electric cigarette lighter. 3,621,196, Cl. 219-269.

Samson, Robert H.: *See—*
Horsey, William C.; Samson, Robert H.; and McCauley, Don O.,3,621,246.

Sanders Associates, Inc.: *See—*
Billings, Philip M., 3,621,152.
Cann, Alfred J., 3,621,221.
Pappas, George W., 3,621,150.
Rusch, William T., 3,620,117.
Schwartz, Jacob; and Naiman, Charles S., 3,620,597.

Sandoz-Wander, Inc.: *See—*
Houlihan, William J., 3,621,033.
Houlihan, William J.; and Manning, Robert E., 3,621,056.

Sandvikens Jernverks Aktiebolag: *See—*
Torelli, Aldo; and Jacquemet, Andre, 3,620,158.

Sangster, Frederik Leonard Johan: *See—*
Teer, Kees; and Sangster, Frederik Leonard Johan,3,621,283.

Sanner, James W.: *See—*
Cohly, Mauj A.; and Sanner, James W.,3,620,775.

Sano, Kenji: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Mashiro; and Arima, Hideki,3,621,058.

Santi, John D., to Briggs & Stratton Corporation. Long lived switch means for inductive D.C. circuits. 3,621,275, Cl. 307-137.

Santomieri, Louis S., to Deseret Pharmaceutical Company, Inc. Variable aperture fluid flow control apparatus. 3,620,500, Cl. 251-149.1

Santroch, George; and Davis, Martin A., to Ayerst, McKenna & Harrison, Limited. Derivatives of 2-azido-2-hydroxy-1-naphthaleneacetic acid β-lactones and preparation thereof. 3,621,038, Cl. 260-343.3

Sanyo Electric Works Ltd.: *See—*
Hiraoka, Hideto, 3,620,856.

Sasaki, Ryoichi: *See—*
Takeuchi, Hisasuke; Sasaki, Ryoichi; Hataya, Humio; Hiraga, Ryo; Ishibashi, Eiichi; and Koyama, Takao,3,621,310.

Sasaki, Sadao, to Tokyo Shibaura Electric Co., Ltd. Master-slave type J-K flip-flop circuits comprised by current switching type logical circuits. 3,621,289, Cl. 307-247.

Sato, Hiromitsu: *See—*
Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakajima, Jun,3,621,190.

Sato, Hiroshi; and Toshima, Hisashi, to Hitachi, Ltd. Thrust bearing assembly. 3,620,582, Cl. 308-160.

Sato, Masamichi: *See—*
Honjo, Satoru; Tamai, Yasuo; Sato, Masamichi; and Matsumoto, Seiji,3,620,798.

Sato, Masataro. Connector-hook assembly. 3,620,562, Cl. 294-82.

Sauer, Winfriede: *See—*
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Voemel, Wolfgang; and Sauer, Winfriede,3,621,022.

Sauve, Herber A.; and Sloan, David C. O., to Sylvania Electric Products, Inc. Optical assembly system. 3,619,886, Cl. 29-203.

Savit, Carl H., to Western Geophysical Company of America. Low frequency gas exploder. 3,620,327, Cl. 181-0.5

Savoie, Hilbert J., Jr. Air-gas metering and recirculating apparatus. 3,620,213, Cl. 128-142.

Sawada, Kingo; Kato, Shoichi; and Ota, Tadashi, to Toyoda Koki Kabushiki Kaisha. Automatic bearing press-fit machine. 3,619,888, Cl. 29-208.

Saxman, Richard Lewis: *See—*
Corliss, Duncan Simmons; Keast, Russell Raymond; and Saxman, Richard Lewis,3,620,979.

Schaaf, Robert: *See—*
Howard, Sol; and Schaaf, Robert,3,619,989.

Schadt, Martin: *See—*
Williams, Digby F.; and Schadt, Martin,3,621,321.

Schaff, Paul W., to Eaton Yale & Towne, Inc. Parallelogram ice tray cavity. 3,620,497, Cl. 249-127.
Scharer, Herman W.: *See—*
Henkel, Neville T.; Wright, Harry; and Scharer, Herman W.,3,620,066.
Scharfman, Howard: *See—*
Perreault, Henry W.; and Scharfman, Howard,3,621,481.
Schellenberg, Matthias; and Marthaler, Max, to Ciba Limited. Dyestuff bleaching preparation for the photographic silver dyestuff bleaching process. 3,620,744, Cl. 96-53.
Scherer, Lorenz: *See—*
Eggenmuller, Alfred; Scherer, Lorenz; Bellan, Heinrich; and Wohrle, Rudolf,3,619,995.
Schering AG: *See—*
Gutsche, Klaus; and Schroder, Eberhard, 3,621,026.
Schickle, Gerhard, to Telefunken Patentverwertungsgesellschaft m.b.H. Controlled Gunn effect device. 3,621,306, Cl. 307-299.
Schild, A., S.A.: *See—*
Fluck, Josef, 3,620,337.
Schindler, James C.; Weimer, Ralph E.; and Herbert, Ronald M., to Mc Donald's System, Inc. Bun toaster. 3,620,156, Cl. 99-349.
Schindler, Kurt: *See—*
Wehde, Heinz; Schindler, Kurt; Rogge, Joachim; and Czinczel, Armin,3,620,576.
Schlamp, Herman, to Ronson Corporation. Portable heating device. 3,620,661, Cl. 431-344.
Schlaudroff, Leo M., to General Electric Company. Apparatus for applying unhardened adhesive material to a laminated structure. 3,620,885, Cl. 156-563.
Schleppnik, Alfred A.; and Oftedahl, Marvin L., to Monsanto Company. Unsaturated acyclic ketones. 3,621,063, Cl. 260-594.
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P., to Texaco Inc. Hydrogen and carbon monoxide from slurries of solid carboniferous fuels. 3,620,698, Cl. 48-206.
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P., to Texaco Inc. Recovery of entrained carbon in synthesis gas. 3,620,700, Cl. 48-215.
Schlumberger Technology Corporation: *See—*
Schwartz, Robert J., 3,621,255.
Schmeling, William H.: *See—*
Mueller, Armand G.; Bast, Orval C.; and Schmeling, William H.,3,621,161.
Schmelzer Corporation: *See—*
Benjamin, Benjamin C., 3,620,523.
Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberhart; and Zecher, Wilfried, to Farbenfabriken Bayer Aktiengesellschaft. Process for the production of cross-linked elastomers from blocked isocyanate-containing prepolymers. 3,621,000, Cl. 260-77.5
Schmid, Howard C. Pulsating valves. 3,620,023, Cl. 61-13.
Schmid, Howard C. Soil irrigator water and sediment drain. 3,620,228, Cl. 137-107.
Schmid, Rolf: *See—*
Porret, Daniel; Batzer, Hans; Schmid, Rolf; and Ruf, Peter,3,620,983.
Schmidt, Felix Helmut: *See—*
Berger, Herbert; Dold, Otto; Kruger, Dietrich; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald,3,621,016.
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut,3,621,057.
Schmidt, Georg: *See—*
Zieg, Wilhelm; Schmidt, Georg; Hauck, Edgar; Massell, Ingo; and Gruebel, Gustav,3,620,115.
Schmidt, Robert W. Power amplifier. 3,620,091, Cl. 74-34.
Schmidt-Wallace Inc.: *See—*
Wallace, Charles H., 3,620,766.
Schmitt, Edward Emil; and Polistina, Rocco Albert, to American Cyanamid Company. Cylindrical prosthetic devices of polyglycolic acid. 3,620,218, Cl. 128-334.
Schmitzer, Willi, to Maschinenfabrik Hennecke GmbH. Applicator and gantry for use with conveyor belts in the manufacture of foam plastic section members. 3,620,188, Cl. 118-323.
Schnabel, Wilhelm J.: *See—*
Kober, Ehrenfried H.; and Schnabel, Wilhelm J.,3,620,929.
Schnegg, Kurt, to Leclanche S.A. Method of detecting the end-of-charge condition of an electric storage battery under charge and device for the carrying out of this method. 3,621,359, Cl. 320-43.
Schneider, Joseph: *See—*
Neidhardt, Manfred; and Schneider, Joseph,3,621,204.
Schoch, Robert, to Weinman, A.G. Adjustable shoe closure device having a spring shackle. 3,619,871, Cl. 24-68.
Schoen, Karl; and Finizio, Michael, to Endo Laboratories Inc. a-Aminoalkyl-2,6-diaryl-4,5,6,7-tetrahydroindoles and 4-oxo derivatives thereof. 3,621,027, Cl. 260-293.61
Schopper, Fritz. Method and structure for reduction of shock waves. 3,620,484, Cl. 244-1.
Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Farbenfabriken Bayer Aktiengesellschaft. Amido-thiono-phosphoric acid phenyl esters. 3,621,082, Cl. 260-941.
Schreinemakers, Josephus. Factory made tray for taking impressions on a toothless upper jaw. 3,619,903, Cl. 32-17.
Schroder, Eberhard: *See—*
Gutsche, Klaus; and Schroder, Eberhard,3,621,026.
Schroder, Hans-Georg: *See—*
Stache, Ulrich; Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Schroder, Hans-Georg,3,621,014.
Schroeder, Duane Arthur; Weiss, Alvin Dennis; and Giltner, Benedict Clare, to Methode Development Company. Resistance material and resistance elements made therefrom. 3,620,840, Cl. 117-227.
Schroeder, Peter, to Paul Weber AG. Container for the continuous treatment of web-of strand-like textile material with a treatment medium. 3,620,052, Cl. 68-9.
Schulte, Friedrich: *See—*
Cremer, Joseph; Harnisch, Heinz; Schulte, Friedrich; and Hinz, Arnulf,3,620,753.
Schutt, John B., to United States of America, National Aeronautics and Space Administration. Potassium silicate-zinc coatings. 3,620,784, Cl. 106-84.
Schwab, Pierre P., to McGraw-Edison Company. Miniature switch with multiple cam-operated switch contacts. 3,621,157, Cl. 200-6.
Schwabe, Peter: *See—*
Golitz, Hans Dietrich; Simmler, Walter; and Schwabe, Peter,3,621,047.
Schwartz, Jacob; and Naiman, Charles S., to Sanders Associates, Inc. Method and apparatus for non-linear optical limiting. 3,620,597, Cl. 350-160.
Schwartz, Mark G.: *See—*
Ellinger, Rudolph H.; and Schwartz, Mark G.,3,620,757.
Schwartz, Robert J., to Schlumberger Technology Corporation. Two detector pulse neutron logging porosity technique. 3,621,255, Cl. 250-83.1
Schwarz, Francisc, to United States of America, National Aeronautics and Space Administration. Load insensitive electrical device. 3,621,362, Cl. 321-2.
Schwarze, Werner, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Plant growth regulating compositions including cyanoalkylamino substituted triazines. 3,620,710, Cl. 71-93.
Schwarzkopf Development Corporation: *See—*
Pohler, Alfred, 3,621,192.
Schweizerische Industrie-Gesellschaft: *See—*
Bosshard, Fritz, 3,620,111.
Schy, Stuart T.: *See—*
Hetzel, Frank L.; and Schy, Stuart T.,3,620,294.
SCM Corporation: *See—*
Bradbury, Wilburn F., 3,621,205.
Scolari, Gianni. Single maneuvering level control for tracked vehicles. 3,620,096, Cl. 74-469.
Scott & Fetzer Company, The: *See—*
Horrocks, Raymond G., 3,620,104.
Scott Bader Company Limited: *See—*
Parkinson, Norman; Blakely, Christine Mary; and Russell, Robert Francis, 3,620,366.
Scott, Benton Boyd: *See—*
Eckenbrecht, Robert Roy; and Scott, Benton Boyd,3,621,121.
Scott, Eugene W.; and Chapin, Roger F., Jr., to Westinghouse Electric Corporation. Water cooler cabinet construction with tilted front panel. 3,620,452, Cl. 239-29.5
Scott, John F., to Jan Marcel Didier Aron-Samuel. Method and compositions for treatment of mental illness. 3,621,097, Cl. 424-247.
Scribner, Albert W., to Pitney-Bowes, Inc. Label aligning system. 3,621,206, Cl. 235-61.11
Seablom, Wendell. Bottle transfer coupling device. 3,620,267, Cl. 141-364.
Seaquist, Alfred J.: *See—*
Eklund, Henrik J.; and Seaquist, Alfred J.,3,620,911.
Searle, Robert F.: *See—*
Hendershot, James R.; and Searle, Robert F.,3,620,335.
Segawa, Kazutoshi, to Matsushita Electric Industrial Co., Ltd. Frequency discriminator circuit having a narrow detection band. 3,621,409, Cl. 329-110.
Seiber, James N.: *See—*
Tolkmith, Henry; Seiber, James N.; and Budde, Paul B.,3,621,031.
Seibold, Glenn C.: *See—*
Erickson, Charles R.; and Seibold, Glenn C.,3,620,309.
Seidel, Joseph: *See—*
Foster, Karl; and Seidel, Joseph,3,620,779.
Seip, Detlev: *See—*
Steppan, Hartmut; Rauterkus, Karl Josef; and Seip, Detlev,3,620,732.
Seiy, Merle E., to Magnavox Company, The. Digital frequency modulated sweep generator. 3,621,403, Cl. 328-61.
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira, to Sumitomo Chemical Co., Ltd. N-Substituted octadicadienoic acid amides as cholesterol lowering agents. 3,621,043, Cl. 260-404.
Sekino, Shozo; Fujishima, Toshiyuki; and Yada, Hiroshi, to Yawata Iron & Steel Co., Ltd. Weldable, ultra high tensile steel having an excellent toughness. 3,620,717, Cl. 75-125.
Selin, Terry G.: *See—*
Berger, Abe; and Selin, Terry G.,3,621,046.
Selin, Terry G., to General Electric Company. Process for preparation of enamines from hydrocarbylsilanes. 3,621,060, Cl. 260-563.
Selman, Jan; and van der Vliet, Hendrik, to Shell Oil Company. Thermal stabilization of polypivaolactone by degassing. 3,621,003, Cl. 260-78.3
Seltzer, Raymond, to M&T Chemicals Inc. Ureido derivatives of isoperthiocyanic acid and the method for their preparation. 3,621,030, Cl. 260-306.8
Senn, Georg, to Spribog AG. Open gutter. 3,620,024, Cl. 61-14.
Sensi, Piero: *See—*
Lancini, Giancarlo; and Sensi, Piero,3,620,920.

Serafin, Robert J.: *See—*
Epstein, Max; Fryberger, David; Serafin, Robert J.; and Van Den Heuvel, Anthony P.,3,621,328.

Service d'Exploitation Industrielle des Tabacs et des Allumettes:*See—*
Bonneric, Francis, 3,621,264.

Sevruk, Albert Nikolaevich: *See—*
Medovar, Boris Izrailevich; Baglia, Vitaly Mikhailovich; Sevruk, Albert Nikolaevich; and Latash, Jury Vadimovich,3,620,287.

Sewell, Donald, to Sola Basic Industries, Inc. Electrical transmisson ine. 3,621,443, Cl. 339-8.

Seymour, Merrill W., to Eastman Kodak Company. Color photographic silver halide emulsions of different developing speed one layer having a DIR coupler. 3,620,745, Cl. 96-68.

Seymour of Sycamore, Inc.: *See—*
Ryder, Francis E., 3,620,266.

Shaffer, Charles V.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,621,407.

Shands, Hazel F. Brummett: *See—*
Brummett, Carl C., 3,619,931.

Shapiro, Wilbur: *See—*
Heller, Stanley; and Shapiro, Wilbur,3,620,581.

Sharples, John, to Rolls-Royce Limited. Rotary piston engines. 3,620,656, Cl. 418-210.

Shaw, Harold M. Movable suspension device. 3,620,331, Cl. 182-36.

Shaw, Robert F. Gas-disabled liquid pumping apparatus. 3,620,650, Cl. 417-417.

Shayman, Charles A. Remote controlled traverse assembly. 3,620,284, Cl. 160-331.

Shekro, Christe M., to KDI Corporation. Second environment safety for projectiles. 3,620,163, Cl. 102-78.

Shell Oil Company: *See—*
Eckert, Rudolf J. A., 3,621,004.
Kruka, Vitold R., 3,620,507.
Magoon, Eugene F.; Cannell, Lawrence G.; and Raley, John H., 3,620,981.
Selman, Jan; and van der Vliet, Hendrik, 3,621,003.
Vogel, Charles B.; and Christensen, Alton O., 3,621,292.
Westra, Simon, 3,619,832.

Shepherd, Denis, to Kidde, Walter, & Company Inc. Means for foam generation. 3,620,306, Cl. 169-15.

Sherrit Gordon Mines Limited: *See—*
Zubryckyj, Nicolas; and Evans, David John Ivor, 3,620,669.

Sherwin-Williams Company, The: *See—*
Foster, Harold Marvin, 3,621,065.

Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio, to Toyo Rayon Kabushiki Kaisha. Process for the preparation of acrylic fibers with odd-shaped sections. 3,621,087, Cl. 264-177.

Shimamura, Tadao: *See—*
Murotani, Masayoshi; Tanaka, Ryoichi; Tachikawa, Keiji; and Shimamura, Tadao,3,621,397.

Shimazaki, Hideo: *See—*
Kitada, Nagayoshi; Shimazaki, Hideo; and Komata, Yasushi,3,620,772.

Shimizu, Toshihide: *See—*
Kitamura, Hajime; and Shimizu, Toshihide,3,621,078.

Shimizu, Yohei. Sanyo Electric Co., Ltd. Flyback transformer coil for television receiver. 3,621,430, Cl. 336-205.

Shin-Etsu Chemical Industry Co., Ltd.: *See—*
Kitamura, Hajime; and Shimizu, Toshihide, 3,621,078.

Shinohara, Kesao, to Hope Kabushiki Kaisha. Base assembly for ski boot heel binding. 3,620,544, Cl. 280-11.35

Shirakawa, Katsuya. Method of upholstering. 3,619,879, Cl. 29-91.1

Shirey, Carey L.: *See—*
Gilgore, William H.; and Shirey, Carey L.,3,620,352.

Shlatz, Myron F.: *See—*
Kelly, Michael J.; and Shlatz, Myron F.,3,620,617.

Shoquist, William A., to Behring Corporation. Plumbing apparatus. 3,620,246, Cl. 137-357.

Short, Oliver A., to Du Pont de Nemours, E. I., and Company. Process of preparing noble metal powders. 3,620,713, Cl. 75-0.50a

Short, Oliver A., to Du Pont de Nemours, E. I., and Company. Process of preparing noble metal alloy powders. 3,620,714, Cl. 75-0.5

Shrage, Moshe: *See—*
Benis, Isak; Benis, William; and Shrage, Moshe,3,619,878.

Shult, Dale L., to Motorola, Inc. Helical resonator having variable capacitor which includes windings of reduced diameter as one plate thereof. 3,621,484, Cl. 333-83.

Shure Brothers Inc.: *See—*
Kogen, James H., 3,621,154.

Siblik, Allen D.: *See—*
Hlinsky, Emil J.; and Siblik, Allen D.,3,621,236.

Sieckmann, Jurgen: *See—*
Muskat, Josef; Klump, Dieter; and Sieckmann, Jurgen,3,620,512.

Siemens Aktiengesellschaft: *See—*
Keller, Wolfgang, 3,620,682.
Peehs, Martin; and Wendler, Friedrich, 3,620,838.

Siemens-Aktiengesellschaft: *See—*
Rubel, Hartmut, 3,620,691.

Sierra Research Corporation: *See—*
Young, Walter J., Jr., 3,621,401.

Siggel, Erhard; Rein, Walter; and Caesar, Horst-Manfred, to Glanzstoff AG. Production of modified diglycol therephthalate polycondensate for injection molding. 3,621,074, Cl. 260-835.

Signetics Corporation: *See—*
Kiba, William M., 3,620,795.

Silcocks, Harry L.: *See—*
Higley, Wayne R.; Silcocks, Harry L.; and Waggoner, James A.,3,620,208.

Silverthorne, John D. Convertible back pack and cot apparatus. 3,620,428, Cl. 224-25.

Simmler, Walter: *See—*
Dahm, Manfred; Neiderprum, Hans; and Simmler, Walter,3,620,984.
Golitz, Hans Dietrich; Simmler, Walter; and Schwabe, Peter,3,621,047.

Simmons, Harold C., to Parker-Hannifin Corporation. Flow control valve for fuel injection nozzles and the like. 3,620,249, Cl. 137-503.

Simmons, Todd S.: *See—*
Lachowicz, Donald R.; Simmons, Todd S.; and Kreuz, Kenneth L.,3,621,050.

Simms, John A., to Du Pont de Nemours, E. I., and Company. Package-dispensing device. 3,620,417, Cl. 222-136.

Simon-Carves Limited: *See—*
Martindale, Allan; Parr, Bryan R.; and Smith, Michael J. S., 3,620,035.

Simonet, Guy, to L'Air Liquide Societe Anonyme Pour l-Etude et l Exploitation des Procedes Georges Claude. Method for producing high-purity oxygen from commercially pure oxygen feedstream. 3,620,032, Cl. 62-28.

Sims, Marion W.; and Avila, Francisco C., to General Electric Company. Method for bonding a laminated structure and apparatus for applying unhardened adhesive material to the laminated structure. 3,620,886, Cl. 156-563.

Sinclair, John C., to Iowa State University Research Foundation, Inc. Blood flow meter. 3,620,207, Cl. 128-2.05

Sindall, John Henry; and Dixon, Frederick Charles, to Imperial Metal Industries (Kynoch) Limited. Safety valves. 3,620,237, Cl. 137-67.

Singer Company, The: *See—*
Bolzan, James J., Jr.; and Fromknecht, Charles T., 3,619,851.
Mishcon, Lester; and Reagan, Donald W., 3,620,049.
Rolff, William, 3,621,180.

Singer, Robert M.: *See—*
Isaacs, Hugh Solomun; and Singer, Robert M.,3,620,859.

Singer-General Precision, Inc.: *See—*
Pancoe, Edward G., 3,619,911.

Singh, Shobha; and Van Uitert, Le Grand G., to Bell Telephone Laboratories, Incorporated. GaAs diode with up-converting phosphor coating. 3,621,340, Cl. 313-108.

Singleton, Fred G.: *See—*
Svoboda, Glenn R.; Singleton, Fred G.; and Eshleman, Lindley H.,3,621,093.

Singleton, Ogle R., Jr.; Kesler, Sidney B., Jr.; and Warren, William E., to Reynolds Metals Company. Stress relieving apparatus and method. 3,620,516, Cl. 263-3.

Sinloihi Co.: *See—*
Takano, Ryoshiro; Ishii, Kunihiko; and Higo, Suezi, 3,620,993.

Sioma, Edward M.: *See—*
Kelley, Louis E.; Alexander, Raymond B.; and Sioma, Edward M.,3,620,071.

Sitko, Robert H.: *See—*
Clearman, Jack F.; Ohlsson, Leonard W.; and Sitko, Robert H.,3,620,040.

Sivertsen, David R.; Cecil, Olin B.; and Haberecht, Rolf R., to Texas Instruments, Incorporated. Methods of making a composite dielectric body. 3,620,945, Cl. 204-157.1

Sjoberg, Berndt Olof Harald: *See—*
Bamberg, Peter; Ekstrom, Bertil Ake; and Sjoberg, Berndt Olof Harald,3,621,029.

Sjogren, Sven. Signal level control instrument for sound transmission systems. 3,621,404, Cl. 328-162.

Skocir, Rudolf, to Maschinenfabrik Turner A.G. Apparatus for feeding flexible sheet material to a pair of transport rollers. 3,620,528, Cl. 271-51.

Slade, Philip E.; Estes, Robert T.; and Randall, James C., to Monsanto Company. White thermally stable polyether modified polyester fibers and method of production. 3,620,824, Cl. 117-138.8

Slater, William L.: *See—*
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P.,3,620,698.
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P.,3,620,700.

Slingluff, Jack E. Electronic radioactive sensing and scanning device. 3,621,251, Cl. 250-71.5

Sloan, David C. O.: *See—*
Sauve, Herber A.; and Sloan, David C. O.,3,619,886.

Slocum, Richard A.: *See—*
Jen, Dian P.; Slocum, Richard A.; and Valentino, Carl R.,3,621,213.

Slykhouse, Thomas E., to Dow Chemical Company, The. Miniature pressure transducer. 3,620,084, Cl. 73-398.

Smajo, Joseph J., to Opto/Graphics, Inc. Method for determining proper color balance in color printing base. 3,620,727, Cl. 96-27.

Small, Edward A.: *See—*
Spellman, Vernon C.; Bergfelt, Nils H.; and Small, Edward A.,3,619,840.

Smith, Andrew L., to Monsanto Company. Process of improving the resistance of soiling of melt spun fibers. 3,620,823, Cl. 117-138.8

Smith, Charles A., to Sperry Rand Corporation. Baler feeder finger holder. 3,620,359, Cl. 198-223.
Smith, Donald Tolman: *See—*
Antas, Stanley Casimir; Genneken, George Thomas; and Smith, Donald Tolman,3,621,117.
Smith, George E.; and Walden, Robert H., to Bell Telephone Laboratories, Incorporated. Thermal relay. 3,621,446, Cl. 338-23.
Smith, Horace L., Jr., to Smithern Industries Inc. Broke clearing apparatus. 3,620,110, Cl. 83-66.
Smith, John M.: *See—*
Bratton, Francis H.; and Smith, John M.,3,620,166.
Smith, John P.: *See—*
Morse, Charles E.; and Smith, John P.,3,621,146.
Smith, Kay D.: *See—*
Smith, Kent F.; and Smith, Kay D.,3,621,387.
Smith, Kent F.; and Smith, Kay D., to General Instrument Corporation. Computer controlled tester for integrated circuit devices. 3,621,387, Cl. 324-73.
Smith Kline & French Laboratories: *See—*
Mayron, David; and Tiano, Frank J., 3,621,094.
Yu-Wen Jen, Timothy; and Loev, Bernard, 3,621,025.
Smith, Michael J. S.: *See—*
Martindale, Allan; Parr, Bryan R.; and Smith, Michael J. S.,3,620,035.
Smith, Richard A.: *See—*
Blachly, Donald L.; and Smith, Richard A.,3,620,055.
Smithern Industries Inc.: *See—*
Smith, Horace L., Jr., 3,620,110.
Smiths Industries Limited: *See—*
Waghorn, Leonard Cyril; and Turner, Peter Raymond, 3,620,601.
Smitley, Marion L., to Holley Carburetor Company. Stuck throttle safety device. 3,620,324, Cl. 180-103.
Smolka, Thomas G., to Wiener Metallwarenfabrik Smolka & Co. Shoetree. 3,619,837, Cl. 12-120.5
Snia Viscosa: *See—*
Tamura, Yoshio; and Ando, Satoshi, 3,620,904.
Snyder, Carl J., to Westinghouse Electric Corporation. Load regulation apparatus. 3,621,271, Cl. 307-38.
Snyder, Clermont J.; and Moore, Jack P., to Anaconda Wire and Cable Company. Descaling copper rods. 3,620,853, Cl. 148-13.2
So, Stephen W., to FMC Corporation. Fluid mixing device. 3,620,506, Cl. 259-4.
Sobanski, Stanley J.; Mastriforte, Otil F.; and Noell, Godwin L., to Chandler Evans Inc. Method of broaching a blank upon a shaft. 3,619,882, Cl. 29-159.2
Sobchak, Frank L.: *See—*
Brouwer, Frans; and Sobchak, Frank L.,3,621,135.
Societe a Responsabilite Limitee Centre de Recherches du Fer Blanc: *See—*
Endle, Joseph, 3,620,934.
Societe A. Responsabilite Limitee Societ d' Etudes et de Developpement Industriel Proclem:*See—*
Latour, Claude, 3,620,044.
Societe Anonyme dite: SOLEPHOT: *See—*
Daury, Claude, 3,620,152.
Societe Chimique des Charbonnages: *See—*
Denis, Michel; and Barillot, Maurice, 3,620,946.
Societe d'Assistance Technique pour Produits Nestle S.A.:*See—*
Mishkin, Abraham Rudolph; and Symbolik, William Stephen, 3,620,776.
Societe d'Etudes et d'Applications Biochimiques:*See—*
Laboureur, Pierre; Brunaud, Marcel D. P.; and Langlois, Claude, 3,620,923.
Societe d'Etudes et de Deveoppement des Aeroglisseurs Marins Terrestres et Amphibies S.E.D.A.M.:*See—*
Faure, Marc; and Arsandaux, Louis, 3,620,325.
Societe Franco-Hispano-Americaine Francispam: *See—*
Hocq, Robert R., 3,620,015.
Societe Nationale Industrielle Aerospatiale: *See—*
Soulez-Lariviere, Jean, 3,620,640.
Soderberg, John Lennart; Back, Jarl Sigurd; and Hakansson, Christer Lennart, to Aktiebolaget Bofors. Method of producing fine-crystalline cast charges with unoriented crystalline structure of 2,4,6-trinitrotoluene or explosive compositions containing 2,4,6-trinitrotoluene. 3,620,857, Cl. 149-18.
Sogi, Hidenobu, to Kuraray Co., Ltd. Food packaging container comprising molded laminated polyethylene and ethylene-vinyl alcohol. 3,620,435, Cl. 229-3.5
Sogo, Yoshitaka: *See—*
Tomita, Yukio; Ito, Shinichi; Sogo, Yoshitaka; and Morino, Hideki,3,620,338.
Sola Basic Industries, Inc.: *See—*
Sewell, Donald, 3,621,443.
Solartron Electronic Group Limited, The: *See—*
Swinstead, Nicholas Darryl, 3,621,158.
Solid State Technology, Inc.: *See—*
Willis, John George, 3,621,398.
Solmecke, Klaus-Dieter: *See—*
Peters, Henning; and Solmecke, Klaus-Dieter,3,620,405.
Solomon, David H., to Georgia Kaolin Company. Surface modified clays and methods of making the same. 3,620,789, Cl. 106-288.
Solvay & Cie: *See—*
De Coene, Robert, 3,621,080.
Mormont, Rene; and Duez, Jean, 3,619,986.
Somat Corporation: *See—*
Hankes, Robert W., 3,620,460.
Somers, Allen E.: *See—*
Carr, Norman L.; Somers, Allen E.; and Stahlfeld, Donald L.,3,621,217.
Somerville, Robert H.; and Bakker, Lewis P., to McDonnell Douglas Corporation. Continuous heat pipe and artery connector therefor. 3,620,298, Cl. 165-105.
Sommer, John G., Jr.: *See—*
Hartz, Walter A.; Meyer, Daniel A.; and Sommer, John G., Jr.,3,620,901.
Soroka, Joe F.: *See—*
Johnson, Kenneth R.; Tyson, W. Gerald; and Soroka, Joe F.,3,619,975.
Soulez-Lariviere, Jean, to Societe Nationale Industrielle Aerospatiale. Propeller or fan shrouds. 3,620,640, Cl. 415-126.
Southalls (Birmingham) Limited: *See—*
Oates, Frank, 3,620,894.
Souviner, George E.: *See—*
Kuntz, William K.; and Souviner, George E.,3,620,122.
Space Administration: *See—*
Anderson, Karl F.; and Lynch, Thomas L., 3,621,285.
Spanoudis, Louis, to Owens-Illinois, Inc. Method of thermal tempering transparent glass bodies. 3,620,706, Cl. 65-114.
Specialized Products, Inc.: *See—*
Mc Kinnon, Richard E., 3,620,390.
Spectral Dynamics Corporation: *See—*
Davis, Robert D., 3,621,388.
Speedcranes Limited: *See—*
Morrison, Robert, 3,620,504.
Spellman, Vernon C.; Bergfelt, Nils H.; and Small, Edward A., to Optical Coating Laboratory, Inc. Electron beam evaporation source. 3,619,840, Cl. 13-31.
Sperry Rand Corporation: *See—*
Brelsford, John E.; and Howell, Edmund O., 3,619,992.
Curnow, John W., 3,620,247.
Smith, Charles A., 3,620,359.
Welker, Jerry W., 3,620,384.
Spotting Equipment Co., Inc.: *See—*
Harris, William M.; and Reese, Julian, 3,619,830.
Spribog AG: *See—*
Senn, Georg, 3,620,024.
Spring, Ferdinand E., Jr., to Ralston Purina Company. Cook in the bowl cereal. 3,620,761, Cl. 99-80.
Spring, Ferdinand E., Jr.: *See—*
Ver Steeg, Melvin A., Jr.; and Spring, Ferdinand E., Jr.,3,620,760.
Spurlin, Harold M.: *See—*
Klug, Eugene D.; Spurlin, Harold M.; and Young, William L., III,3,620,970.
Square D Company: *See—*
Mueller, Armand G.; Bast, Orval C.; and Schmeling, William H., 3,621,161.
S.S.S. Patents Limited: *See—*
Clements, Herbert Arthur; and Heybourne, Robert H., 3,620,336.
St. Amour, Joseph, to Digital Equipment Corporation. Tape transport hub. 3,620,468, Cl. 242-68.3
Staadt, Harold E.: *See—*
Hradel, Joseph R.; and Staadt, Harold E.,3,620,858.
Stach, Kurt: *See—*
Berger, Herbert; Dold, Otto; Kruger, Dietrich; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald,3,621,016.
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Voemel, Wolfgang; and Sauer, Winfriede,3,621,022.
Stache, Ulrich; Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Schroder, Hans-Georg, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 17α,21-Orthocarbonates of steroid derivatives. 3,621,014, Cl. 260-239.55
Stache, Ulrich: *See—*
Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Stache, Ulrich,3,621,015.
Stahlfeld, Donald L.: *See—*
Carr, Norman L.; Somers, Allen E.; and Stahlfeld, Donald L.,3,621,217.
Stamps, Virgil O.: *See—*
Keeling, Richard W.; Gilbreath, Cecil R.; and Stamps, Virgil O.,3,621,412.
Standard Alliance Industries, Inc.: *See—*
Thibodeau, John L., 3,620,321.
Standard Oil Company: *See—*
Ott, Louis E., 3,620,708.
Standard Screw Company: *See—*
Mongerson, Paul A.; Moen, Alfred M.; and Bell, Frank W., 3,620,254.
Stanford, James R.; and Vogelsang, Paul G., Jr., to Nalco Chemical Corporation. Scale inhibition. 3,620,974, Cl. 252-8.55
Stanwood, Robert K., to United States of America, Navy. Automatic optical focusing system for TV cameras. 3,621,136, Cl. 178-7.92
Starcher, Paul S.; Trecker, David; and McKeon, James E., to Union Carbide Corporation. Oxidation of lactams to cyclic imides. 3,621,012, Cl. 260-239.3
Starks, Charles M.: *See—*
Hood, Larry H.; Rose, LeRoy; and Starks, Charles M.,3,620,189.
Statham Instruments, Inc.: *See—*
Stedman, Cecil K., 3,621,435.

Staudt, Heinrich: *See—*
Kuhn, Karl-Ernst; Kuschmierz, Heinz; and Staudt, Heinrich,3,620,199.

Stauffer Chemical Company: *See—*
Ellinger, Rudolph H.; and Schwartz, Mark G., 3,620,757.
Fite, Ellis Glenn, 3,620,972.
Humphrey, Lawrence F., 3,621,084.
Price, Glenn R., 3,621,083.
Von Pless, James A.; and Cope, Richard P., Jr., 3,620,938.

Stechmann, Helmut, to Kienzle Uhrenfabriken GmbH. Amplitude stabilized transistor drive circuit for mechanical oscillatory system. 3,621,468, Cl. 331-109.

Stedman, Cecil K., to Statham Instruments, Inc. Transducer beam with back-to-back related deposited film type strain gages. 3,621,435, Cl. 338-2.

Steelcase, Inc.: *See—*
Merrill, Frederick F., 3,619,853.

Steele, Emmett,: *See—*
Fonda-Bonardi, Giusto, 3,620,017.

Steen, Albert C.; and Steen, John W., to J&L Engineering Company, Inc. Sugar cane dry cleaning plant. 3,620,369, Cl. 209-3.

Steen, John W.: *See—*
Steen, Albert C.; and Steen, John W.,3,620,369.

Steigerwald, Wolf-Erhard: *See—*
Eberwein, Helmut; and Steigerwald, Wolf-Erhard,3,621,440.

Stein, Max M., to Elco Corporation. Integrated circuit module electrical connector. 3,621,444, Cl. 339-14.

Steinbrunn, Gustav: *See—*
Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht,3,621,055.

Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; Jeserich, Wolfgang-Dieter; and Reichel, Bernd, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Accelerating anionic polymerization of lactams. 3,621,001, Cl. 260-78.

Steinlin, Felix: *See—*
Mueller, Willy; and Steinlin, Felix,3,620,788.

Stembel, Oren G. Cassette storage container. 3,620,367, Cl. 206-65.

Stendel, Wilhelm: *See—*
Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm,3,621,082.

Stephens, Joe B.; and Ashcraft, Joel N., to AMBAC Industries, Incorporated. Booster circuit for ignition systems. 3,620,200, Cl. 123-148.

Steppan, Hartmut; Messwarb, Gunter; and Luders, Walter, to Kalle Aktiengesellschaft. Light sensitive reproduction layer and process. 3,620,733, Cl. 96-33.

Steppan, Hartmut; Rauterkus, Karl Josef; and Seip, Detlev, to Kalle Aktiengesellschaft. Process for the preparation of water-insoluble reproduction layers and for their subsequent image- wise differentiation. 3,620,732, Cl. 96-33.

Sterilizer Control Royalties: *See—*
Davis, Ward Benjamin, 3,620,676.

Sterling Drug Inc.: *See—*
Archer, Sydney; and Lorenz, Roman R., 3,621,062.

Sternberg, George P. Fermentable flour water mixture treatment. 3,620,173, Cl. 107-54.

Sterrett, Robert W.; Jacob, Francis J.; and Chemberlain, Merle D., deceased0 (by Chamberlain, Lois M.; executrix), to Grace, W. R., & Co., mesne. Venting roof insulation product. 3,619,961, Cl.

Stevens, Frank W.; and Young, Harvey Theodore, to Becton, Dickinson and Company. Retainer valve assembly for syringe. 3,620,418, Cl. 222-209.

Stevenson, Paul D.; and Tucholski, Leon A., to General Motors Corporation. Central hydraulic system for a vehicle. 3,620,646, Cl. 417-79.

Stewart, David John. Web transport systems. 3,620,481, Cl. 242-203.

Stewart-Warner Corporation: *See—*
Brouwer, Frans; and Sobchak, Frank L., 3,621,135.

Stickley, Beryl C.; and Tutle, Edward G., to General Electric Company. Housing for electrical components. 3,621,112, Cl. 174-50.52

Stier, Karl Heinrich. Gyro compasses. 3,619,905, Cl. 33-72.

Stillman, Ben, to Adcotech Corporation. Rotary gate valve. 3,620,255, Cl. 137-625.45

Stoffer, C Daniel W., to Collins Radio Company. Balanced modulator with JFET's voltage controlled resistors. 3,621,473, Cl. 332-23.

Stol, Miroslav; Chromecek, Richard; Stoy, Vladimir; Kliment, Karel; and Otoupalova, Jaroslava, to Ceskoslovenska akademie ved. Photographic light-sensitive layers containing polymer of polyol ester of $\alpha\beta$-unsaturated acid. 3,620,751, Cl. 96-114.

Stoll, Milton. Support structure. 3,621,186, Cl. 219-138.

Stone, Aidan M., to General Electric Company. Closure operated safety switch for automatic appliance. 3,621,165, Cl. 200-61.62

Stone, Robert L., to Raymond Engineering, Inc. Tape transports. 3,620,473, Cl. 242-192.

Stopka, Benjamin F.; Day, Dennis J.; Harmon, James V.; and Holt, Robert G., to Collins Radio Company. Gain controlled amplifier. 3,620,631, Cl. 325-404.

Stork, Harald: *See—*
Berger, Herbert; Dold, Otto; Kruger, Dietrich; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald,3,621,016.

Stotz, Erich, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Hinge operating lever for use in vehicles, particularly as a hand brake lever for automotive vehicles. 3,620,099, Cl. 74-524.

Stover, William A.; and Oleck, Stephen M., to Mobil Oil Corporation. Hydrocracking catalyst composition, method for making the same and hydrocracking in the presence thereof. 3,620,964, Cl. 208-111.

Stoy, Vladimir: *See—*
Stol, Miroslav; Chromecek, Richard; Stoy, Vladimir; Kliment, Karel; and Otoupalova, Jaroslava,3,620,751.

Straimer, Georg: *See—*
Friedrich, Kurt; and Straimer, Georg,3,621,268.

Strange, Lloyd K.: *See—*
Nichols, Dean P.; and Strange, Lloyd K.,3,620,301.

Strobel, Rudolf G. K.; and Artman, Neil R., to Procter & Gamble Company, The. Nonfoaming and nonscumming instant coffee. 3,620,756, Cl. 99-71.

Strople, Gordon N.; and Mills, Justin W., Jr., to Lif-O-Gen, Inc. Method for sterilizing gas containers and filling same with a sterile gas. 3,620,265, Cl. 141-8.

Strubhar, Paul D.: *See—*
Hoelscher, Max W.; and Strubhar, Paul D.,3,620,799.

Struthers Patent Corporation: *See—*
Ganiaris, Neophytos, 3,620,034.

Stryker, Harvey I.: *See—*
Ross, John M.; and Stryker, Harvey I.,3,621,008.

Studebaker, James B.; Minick, George A.; and Whittier, John D., to Wilfley, A. R., and Sons, Inc. Centrifugal pump. 3,620,642, Cl. 415-204.

Stump, Paul W.; Huber, James A.; and Lipinski, John M., to Clevepak Corporation. Method of making tubes. 3,620,869, Cl. 156-190.

Sturm, Hans-Dieter: *See—*
Gaffal, Karl; and Sturm, Hans-Dieter,3,620,639.

Sturm, Rolf Gustav, to Entwicklungsring Sud GmbH. Apparatus for conducting gas. 3,620,557, Cl. 285-228.

Sturtz, David; and Moulton, John R. Mail box signal flag. 3,620,443, Cl. 232-35.

Sugiyama, Masao; Suzuki, Toshio; Noda, Hajime; Kashimura, Saburo; Hato, Shozo; and Tanaka, Hideo, to Hitachi Cable, Ltd. Insulated conductor for communication cable. 3,621,119, Cl. 174-124.

Sullhofer, Heinz. Method of producing in a continuous process plates of polyurethane hard foam with covering plates. 3,620,863, Cl. 156-79.

Sullivan, Cornelius P.: *See—*
Wagner, David H.; Duhl, David N.; Van Der Molen, Edward H.; and Sullivan, Cornelius P.,3,620,855.

Sullivan, Herbert L., to Martin Marietta Corporation. Skiving machine. 3,620,634, Cl. 408-82.

Sumitomo Chemical Co., Ltd.: *See—*
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira, 3,621,043.

Sumitomo Chemical Company, Ltd.: *See—*
Watanabe, Yoshihiro; Kobayashi, Jiro; Toyoshima, Yoshiki; Tokumaru, Toor; and Saito, Masatosi, 3,621,072.

Sumitomo Electric Industries Ltd.: *See—*
Matsummura, Shigeru; Asano, Nobuyuki; and Kawaguchi, Munetaka, 3,620,996.

Summers, Charles Gene: *See—*
Young, Evan Johnson; and Summers, Charles Gene,3,620,980.

Sun Oil Company: *See—*
Polishuk, Arthur T., 3,620,975.

Sunada, Tsuyoshi: *See—*
Tanito, Keiko; Kato, Norio; Kinoshita, Shosaku; Kinoshita, Masahiro; and Sunada, Tsuyoshi,3,620,944.

Sunbeam Equipment Corporation: *See—*
Ross, Robert H.; Larko, Robert C.; and Swartzfager, Walter G., 3,620,520.

Superior Electric Company, The: *See—*
Palmero, Albert, 3,621,312.

Sutch, Brian Leo Chudleigh, to Kingston Plastics Limited. Insert conveying device for an injection moulding machine. 3,619,858, Cl. 18-5.

Sutton, David J.: *See—*
Nelson, Clifford L.; and Sutton, David J.,3,620,448.

Suzuki, Toshio: *See—*
Sugiyama, Masao; Suzuki, Toshio; Noda, Hajime; Kashimura, Saburo; Hato, Shozo; and Tanaka, Hideo,3,621,119.

Suzuki, Yoshio: *See—*
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira,3,621,043.

Sverre Munck A/S: *See—*
Munck, Fredrik, 3,620,389.

Svoboda, Glenn R.; Singleton, Fred G.; and Eshleman, Lindley H., to Freeman Chemical Corporation. Process for making reinforced thermoset articles. 3,621,093, Cl. 264-331.

Swanson, Wilford A. Foil forming device. 3,620,065, Cl. 72-297.

Swartz, William E., to Calgon Corporation. Bonito processing. 3,620,767, Cl. 99-111.

Swartzfager, Walter G.: *See—*
Ross, Robert H.; Larko, Robert C.; and Swartzfager, Walter G.,3,620,520.

Swayze, Rue E. Ore concentrator. 3,620,370, Cl. 209-144.

Sweeney, John C. Carpet sample rack. 3,620,378, Cl. 211-177.

Swigger, Paul C.: *See—*
Dodgen, John N.; and Swigger, Paul C.,3,620,154.

Swimquip, Inc.: *See—*
Ehret, Gordon F., 3,620,372.

Swinstead, Nicholas Darryl, to Solartron Electronic Group Limited, The. Electrical switching apparatus. 3,621,158, Cl. 200-14.

Swope, Jerry L. McGraw-Edison Company Terminal box for lifting magnet. 3,621,423, Cl. 335-290.

Sylvania Electric Products Inc.: *See—*
Cluett, Ronald D.; and Larka, Vincent E., 3,621,284.
Hough, Harold L.; and Foss, Charles W., 3,621,232.
Sauve, Herber A.; and Sloan, David C. O., 3,619,886.

Symbolik, William Stephen: *See—*
Mishkin, Abraham Rudolph; and Symbolik, William Stephen,3,620,776.

Symons, Robert C.; Koch, Stanley H.; and Pierce, John B., to Timberjack Machines Limited. Logging apparatus. 3,620,394, Cl. 214-147.

Sze, Samuel: *See—*
Crell, Jesse D.; and Sze, Samuel,3,620,373.

Szeluga, Ludwick; Hoffman, Ernest G.; and Sabo, Roland S., to Veeder Industries Inc. Counter. 3,620,447, Cl. 235-132.

Szymanski, Earl Thaddeus, to Abbott Laboratories. Implant trocar. 3,620,216, Cl. 128-217.

Tachikawa, Keiji: *See—*
Murotani, Masayoshi; Tanaka, Ryoichi; Tachikawa, Keiji; and Shimamura, Tadao,3,621,397.

Tackaberry, Robert B., to American Optical Corporation. Method of surface interference microscopy. 3,620,593, Cl. 350-12.

Tada, Shoji: *See—*
Ono, Nobujiro; Hattori, Hiroshi; Tada, Shoji; and Kaida, Tsunetoshi,3,621,009.

Taguchi, Kikuo: *See—*
Kawamura, Toshiki; Ohneda, Tohru; Nomura, Yasuaki; and Taguchi, Kikuo,3,620,445.

Taiyo Fishery Co. Ltd.: *See—*
Kanemitsu, Tsunetoshi; and Asakura, Yukio, 3,620,754.

Tajima, Iwao: *See—*
Yoshimura, Susumu; Hasegawa, Katsue; Yamamoto, Yoshio; and Tajima, Iwao,3,621,342.

Takahashi, Hiroji: *See—*
Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi,3,620,227.

Takahashi, Masahiro: *See—*
Yoshida, Teruo; Sagara, Takaaki; Ojima, Takashi; Takahashi, Reiji; and Takahashi, Masahiro,3,620,762.

Takahashi, Reiji: *See—*
Yoshida, Teruo; Sagara, Takaaki; Ojima, Takashi; Takahashi, Reiji; and Takahashi, Masahiro,3,620,762.

Takahashi, Yukiharu: *See—*
Kubo, Moritada; Takahashi, Yukiharu; and Miles, T. William,3,621,357.

Takamatsu, Naokichi, to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.). Action device for electric musical instrument. 3,621,105, Cl. 84-1.16

Takano, Ryoshiro; Ishii, Kunihiko; and Higo, Suezi, to Sinloihi Co. Condensation resin of formaldehyde, cyclic aminotriazine and isocyanuric acid. 3,620,993, Cl. 260-37.

Takasago Perfumery Co., Ltd.: *See—*
Moroe, Tatsuo; Hattori, Satohiko; Komatsu, Akira; and Yamaguchi, Yuzo, 3,620,918.

Takeda, Naozi; and Tuzihara, Tosio. Method of making a disk-shaped armature. 3,619,899, Cl. 29-598.

Takeuchi, Hisasuke; Sasaki, Ryoichi; Hataya, Humio; Hiraga, Ryo; Ishibashi, Eiichi; and Koyama, Takao, to Hitachi, Ltd. Duct for magnetohydrodynamic thermal to electrical energy conversion apparatus. 3,621,310, Cl. 310-11.

Tamai, Bungi: *See—*
Saito, Atsushi; Nakayama, Fumio; Tamai, Bungi; Takahashi, Hiroji; Kuwahara, Kazuo; and Kaneko, Takashi,3,620,227.

Tamai, Yasuo: *See—*
Honjo, Satoru; Tamai, Yasuo; Sato, Masamichi; and Matsumoto, Seiji,3,620,798.

Tamai, Yasuo; and Honjo, Satoru, to Xerox Corporation. Cleaning liquid developed electrostatic images by contact with vaporized cleaning fluid. 3,620,800, Cl. 117-37.

Tamura, Yoshio; and Ando, Satoshi, to Kanegafuchi Boseki Kabushiki Kaisha, and Snia Viscosa. Highly crimpable polyamide composite filaments. 3,620,904, Cl. 161-173.

Tan, Sing Liong, to U.S. Philips Corporation. Television camera. 3,621,124, Cl. 178-5.4

Tanaka, Hideo: *See—*
Sugiyama, Masao; Suzuki, Toshio; Noda, Hajime; Kashimura, Saburo; Hato, Shozo; and Tanaka, Hideo,3,621,119.

Tanaka, Masao: *See—*
Mochizuki, Kazuo; Otsuka, Hiroyasu; Katumata, Hideo; Oka, Tetuo; and Tanaka, Masao,3,620,925.

Tanaka, Ryoichi: *See—*
Murotani, Masayoshi; Tanaka, Ryoichi; Tachikawa, Keiji; and Shimamura, Tadao,3,621,397.

Tanaka, Yukio; Mizushina, Jun; Yamagishi, Hitoshi; and Kosaki, Hiroshi, to Kokusai Electric Company Limited. Low frequency induction furnace. 3,621,102, Cl. 13-2.

Tanimoto, Katsukiyo; Urakami, Tamio; and Itadani, Sotaro, to Kurashiki Rayon Co., Ltd. Conveyor belts and process for their manufacture. 3,620,897, Cl. 161-154.

Tanito, Keiko; Kato, Norio; Kinoshita, Shosaku; Kinoshita, Masahiro; and Sunada, Tsuyoshi, to Osaka Prefecture. Process of purifying water by irradiating it. 3,620,944, Cl. 204-158.

Tank, Toomas: *See—*
Tank, Woldemar Heinrich, 3,619,836.

Tank, Woldemar Heinrich, 1/2 to Tank, Toomas. Shoetree. 3,619,836, Cl. 12-117.2

Tappin, Charles L. Fail-safe fuel cutoff device. 3,620,658, Cl. 431-13.

Taradash, Samuel; and Chlumecky, Nicholas, to Commercial Shearing & Stamping Company. Interlocking boltless lining and support structure for underground openings. 3,620,025, Cl. 61-45.

Tarkington, Raife G., to Eastman Kodak Company. Photofabrication system using developed negative and positive images in combination with negative- working and positive-working photoresist compositions to produce resists on opposite sides of a workpiece. 3,620,736, Cl. 96-36.

Tarrson, Irvin S., to Bell & Howell Company. Film end construction for self threading device. 3,620,893, Cl. 161-109.

Tashev, Kyril Hristov: *See—*
Valchev, Alexander Yordanov; and Tashev, Kyril Hristov,3,621,104.

Tassoney, Joseph P.: *See—*
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P.,3,620,698.
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P.,3,620,700.

Taudt, Heinz; and Keller, Hans, to Hell, Rudolf, Kommanditgesellschaft. Method for electronically copying parts of different picture originals. 3,621,126, Cl. 178-6.

Tauriello, Fred S. Pin wheel siren Condensation resin of formaldehyde, yclic. 3,619,936, Cl. 46-53.

Tavernier, Bernard Hippoliet; de Jaeger, Nikolaas Cyriel; and Vanheertum, Johannes Josephus, to Gevaert-Agfa N.V. Lead oxide-containing photoconductive recording process utilizing X-rays or visible light. 3,620,721, Cl. 96-1.

Taylor, Clarence R. Golf bag slip cover. 3,620,276, Cl. 150-52.

Taylor, James R.; and Berry, Clifford M. Animal actuated silo feeding gate. 3,620,192, Cl. 119-16.

Taylor, James W.; and Pace, Robert E., to United States of America, Navy. Deep submergence electrical assembly. 3,621,447, Cl. 339-29.

Taylor, Robert A.: *See—*
Colvin, Oliver D.; Taylor, Robert A.; and Kelly, Samuel C.,3,619,987.

TDK Electronics Company Ltd.: *See—*
Kanbayashi, Naohiko, 3,621,476.

Teague, Charles H.: *See—*
Hatcher, Charles S.; and Teague, Charles H.,3,621,088.

Technical Operations, Incorporated: *See—*
Parrent, George B., Jr.; and Mueller, Peter F., 3,620,611.

Technology Incorporated: *See—*
Kosta, John A., 3,620,725.

Tee-Pak, Inc.: *See—*
Cohly, Mauj A.; and Sanner, James W., 3,620,775.

Teer, Kees; and Sangster, Frederik Leonard Johan, to U.S. Philips Corporation. Device for converting a physical pattern into an electric signal as a function of time utilizing an analog shift register. 3,621,283, Cl. 307-229.

Tegholm Ruben Valdemar, to Atlas Copco AB, mesne. Device for measuring a tunnel section. 3,620,625, Cl. 356-1.

Teijin Seiki Co., Ltd: *See—*
Ueda, Shizuma; and Fujimoto, Shigenobu, 3,620,464.

Tektronix, Inc.: *See—*
Barber, Ronald C., 3,621,299.

Teldix GmbH: *See—*
Wehde, Heinz; Schindler, Kurt; Rogge, Joachim; and Czinczel, Armin, 3,620,576.

Teledyne, Inc.: *See—*
Gilgore, William H.; and Shirey, Carey L., 3,620,352.

Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Schickle, Gerhard, 3,621,306.

Telex Corporation, The: *See—*
Kliewer, Donald L., 3,621,156.

Tenneco Oil Company: *See—*
Brown, Morton E.; Williams, Darrell W.; and Crownover, Albert B., Jr., 3,620,077.
Halbert, William G., Jr., 3,620,303.

Tennyson, Robert N., to Flour Corporation, Ltd., The. Urea plant ammonia recovery system. 3,620,031, Cl. 62-17.

Test, Societe Anonyme d'Etudes Techniques: *See—*
Beguin, Rene; and Burckhardt, Christof, 3,620,090.

Tetronics Research & Development Company, Ltd.: *See—*
Tylko, Jozef K., 3,621,179.

Teurnier, Roger: *See—*
Demartres, Jean; and Teurnier, Roger,3,621,120.

Te Velde, Ties Siebolt, to U.S. Philips Corporation, mesne. Electrode system particularly semiconductor electrode system and method of producing the same. 3,620,832, Cl. 117-210.

Texaco Development Corporation: *See—*
Reynolds, Blake; and Ludeman, Clifford G., 3,620,699.

Texaco Inc.: *See—*
Harbordt, Charles M., 3,620,973.
Lachowicz, Donald R.; Simmons, Todd S.; and Kreuz, Kenneth L., 3,621,050.

McCoy, Frederic C., 3,620,695.
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P., 3,620,698.
Schlinger, Warren G.; Slater, William L.; Dille, Roger M.; and Tassoney, Joseph P., 3,620,700.

Texas Instrument, Incorporated: *See—*
Gray, Foster Lee, 3,620,704.

Texas Instruments, Incorporated: *See—*
Baker, Charles E.; and Martel, Bob E., 3,621,133.
Barlow, Carl A., Jr., 3,621,380.
Coburn, Herbert D.; and Kelly, Gilbert H., 3,620,328.
Gleim, Paul S.; and Bean, Kenneth E., 3,620,833.
Isett, Donald D.; Hellmer, Judy A.; and Van Beek, Herman W., 3,621,208.
Sivertsen, David R.; Cecil, Olin B.; and Haberecht, Rolf R., 3,620,945.
Wisseman, William R., 3,621,411.

Textron Inc.: *See—*
Rombeck, Henry E., 3,620,499.

Thackston, Thomas, to Bard, C. R., Inc. Molded surgical mask. 3,620,214, Cl. 128-146.2

Therm-O-Disc, Incorporated: *See—*
Gerich, Anton J., 3,621,434.
Place, Donald E., 3,621,197.

Thermal Industries of Florida, Inc.: *See—*
Liebermann, Leonard N.; and Lai, Stanley H., 3,621,392.

Thevenaz, Jean, to Paillard S.A. System adapted to grasp the end of a wound strip. 3,620,472, Cl. 242-192.

Theys, Ezra E.; Morse, Hugh B.; and Johnson, Robert B., to Fibreboard Corporation. Apparatus and method for heat sealing cartons. 3,619,977, Cl. 53-376.

Thibert, Joseph A. Wall panel. 3,619,965, Cl. 52-580.

Thibodeau, John L., to Standard Alliance Industries, Inc. Tractor drive conversion. 3,620,321, Cl. 180-46.

Thiele, Kurt, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. N-Propiophenone-norephedrines and salts thereof. 3,621,052, Cl. 260-570.5

Thomas, Frank W.; and Tooke, William R., Jr., to Thomas Manufacturing Company. Coated incandescent electric lamp. 3,621,323, Cl. 313-317.

Thomas Industries Inc.: *See—*
Westby, Kenneth, 3,621,113.

Thomas Manufacturing Company: *See—*
Thomas, Frank W.; and Tooke, William R., Jr., 3,621,323.

Thompson, Edwin A., to Robertshaw Controls Company. Thermocouple apparatus. 3,620,849, Cl. 136-217.

Thompson, Einar T. Nailing machine for wood flooring. 3,619,895, Cl. 29-432.

Thompson, Norman C.; and Merino, Dennis H., to Mattel, Inc. Space glider. 3,619,937, Cl. 46-76.

Thompson, Walter W. Combination ceiling grid and partition receiver. 3,619,960, Cl. 52-241.

Thomson-CSF: *See—*
Carbonel, Michel, 3,621,272.
Plond, Gabriel, 3,621,274.

Thorn, Lawrence B.: *See—*
Dreitzler, David R.; Thorn, Lawrence B.; and Yell, Roy E.,3,621,258.

Thousand, John L. Cross-country amphibious utility vehicle. 3,620,184, Cl. 115-1.

Thrust, Incorporated: *See—*
Macy, James C., 3,621,422.

Tiano, Frank J.: *See—*
Mayron, David; and Tiano, Frank J.,3,621,094.

T. I. (Group Services) Limited: *See—*
Whittington, Keith R., 3,620,629.

Timberjack Machines Limited: *See—*
Symons, Robert C.; Koch, Stanley H.; and Pierce, John B., 3,620,394.

Tjernstrom, Ove: *See—*
Dalmo, Bror; Franked, John; Landhult, Hans; Nordberg, Birger; Ronnevig, Carl; and Tjernstrom, Ove,3,621,315.

Toki, Katsuyuki: *See—*
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira,3,621,043.

Tokumaru, Toor: *See—*
Watanabe, Yoshihiro; Kobayashi, Jiro; Toyoshima, Yoshiki; Tokumaru, Toor; and Saito, Masatosi,3,621,072.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Imamura, Hitoshi; and Ishino, Hiroshi, 3,620,879.
Kubo, Moritada; Takahashi, Yukiharu; and Miles, T. William, 3,621,357.
Sasaki, Sadao, 3,621,289.

Tolkmith, Henry; Seiber, James N.; and Budde, Paul B., to Dow Chemical Company, The. Optically active diamino phosphine sulfides. 3,621,031, Cl. 260-309.

Tomczak, James J., to International Business Machines Corporation. Threshold responsive regenerative latching circuit. 3,621,301, Cl. 307-290.

Tomita, Yukio; Ito, Shinichi; Sogo, Yoshitaka; and Morino, Hideki. Synchronizing speed change gears. 3,620,338, Cl. 192-53.00f

Tong, Duncan, to General Electric Company. Submerged models. 3,619,938, Cl. 46-94.

Tongier, Max, Jr.: *See—*
Loop, Russell W.; Tongier, Max, Jr.; and Cone, Clarence D., Jr.,3,620,595.

Tonka Corporation: *See—*
Good, Thomas W.; and Zbikowski, Theodore H., 3,619,940.

Tonnell, Wilfred T.: *See—*
Chou, Tien S.; Tonnell, Wilfred T.; and Wenstrom, Roger A.,3,620,882.

Tooke, William R., Jr.: *See—*
Thomas, Frank W.; and Tooke, William R., Jr.,3,621,323.

Topfer, Heinz; and Rockstroh, Manfred, to VEB Reglerwerk Dresden. Pneumatic threshold switch with adjustable threshold level. 3,620,252, Cl. 137-625.6

Toray Industries, Inc.: *See—*
Miyamoto, Ryou; Hashizume, Kunio; and Kitamura, Hiroshi, 3,620,662.

Torelli, Aldo; and Jacquemet, Andre, to Sandvikens Jernverks Aktiebolag. Continuous press. 3,620,158, Cl. 100-154.

Toshima, Hisashi: *See—*
Sato, Hiroshi; and Toshima, Hisashi,3,620,582.

Towner, Daniel D., Jr. oxide. 3,619,815, Cl. 2-12.

Toyo Boseki Kabushiki Kaisha: *See—*
Ichikawa, Rinjiro, 3,621,085.

Toyo Rayon Kabushiki Kaisha: *See—*
Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio, 3,621,087.

Toyoda Koki Kabushiki Kaisha: *See—*
Kawabata, Minoru, 3,620,238.
Kikuchi, Makoto; and Saeki, Toyoaki, 3,619,951.
Sawada, Kingo; Kato, Shoichi; and Ota, Tadashi, 3,619,888.

Toyoshima, Yoshiki: *See—*
Watanabe, Yoshihiro; Kobayashi, Jiro; Toyoshima, Yoshiki; Tokumaru, Toor; and Saito, Masatosi,3,621,072.

Trachte, Kurt: *See—*
Van Winsen, Friedrich H.; Trachte, Kurt; and Haverbeck, Gunther,3,620,548.

Trade Bank and Trust Company: *See—*
Crell, Jesse D.; and Sze, Samuel, 3,620,373.

Travel Accessories Manufacturing Company, Inc.: *See—*
Abealter, Duane R., 3,620,396.

Treadwell, Kenneth: *See—*
Larkin, William A.; and Treadwell, Kenneth,3,620,985.

Trecker, David: *See—*
Starcher, Paul S.; Trecker, David; and McKeon, James E.,3,621,012.

Trembath, Robert S.: *See—*
Drews, Reinhold A.; and Trembath, Robert S.,3,620,054.

Trench, Anthony B. Magnetically streamlined heat sink. 3,621,425, Cl. 336-61.

Trico Products Corporation: *See—*
Papadatos, Dionysios D.; Deibel, Raymond A.; and Riester, William C., 3,619,847.

Trimble, Daniel W.: *See—*
Beck, William H.; and Trimble, Daniel W.,3,621,365.

Trostanetsky, Leonid Moiseevich: *See—*
Brumberg, Rafail Mikhailovich; Trostanetsky, Leonid Moiseevich; and Khlebnikov, Albert Leonidovich,3,620,358.

TRW Inc.: *See—*
Allen, Clifford H., 3,620,654.
Hetzel, Frank L.; and Schy, Stuart T., 3,620,294.
Wheaton, Harold L.; and Pekarek, Edward G., 3,620,719.

TRW Semiconductors Inc.: *See—*
Crishal, Joan M.; and Rice, Edward J., 3,620,932.
Ref, Josef; and Finhill, Mort, 3,621,114.

Trythall, William J. C. Pipeline valves. 3,620,256, Cl. 137-625.48

Tschopp, Lloyd D.; and Woerner, Rudolph C., to Petro-Tex Chemical Corporation. Removal of methyl acetylene from butadiene. 3,620,930, Cl. 203-87.

Tschunko, Hubert F. A., to United States of America, National Aeronautics and Space Administration. Optical system support apparatus. 3,620,606, Cl. 350-310.

Tsing, Yuan-Hao: *See—*
Keyes, Marion A., IV; Gudaz, John A.; and Tsing, Yuan-Hao,3,620,915.

Tsuda, Junji; Iwata, Junzo; and Hirano, Chikafusa, to Hitachi Electronics Company Limited, and Hitachi Ltd. Analog line generator. 3,621,227, Cl. 235-197.

Tubuko, Kazuo: *See—*
Yamaguchi, Nario; and Tubuko, Kazuo,3,620,723.

Tucholski, Leon A.: *See—*
Stevenson, Paul D.; and Tucholski, Leon A.,3,620,646.

Tucker, Albert C.: *See—*
Usiak, Edwin P.; and Tucker, Albert C.,3,620,515.

Tummarello, Natale J. Means for mounting concrete structural members. 3,620,277, Cl. 151-41.76

Tunkl Industries, Inc.: *See—*
Tunkl, Julius, 3,620,498.

Tunkl, Julius, to Tunkl Industries, Inc. Information sheet holder. 3,620,498, Cl. 248-278.

Tunstall, Wilfred; and Wegner, Albert. Safety ant-poison bottle. 3,619,934, Cl. 43-131.

Turbo Machine Company: *See—*
Wyatt, William K., 3,620,000.

Turner, David W., to Perkin-Elmer Limited. Electrostatic analyzers with auxiliary focusing electrodes. 3,621,241, Cl. 250-41.9
Turner Electric Corporation: *See—*
Turner, John L., 3,621,160.
Turner, John L., to Turner Electric Corporation. Selective mounting device for in-line switches. 3,621,160, Cl. 200-48.
Turner, Peter Raymond: *See—*
Waghorn, Leonard Cyril; and Turner, Peter Raymond,3,620,601.
Turnock, Philip Hain; Lee, Max Nai Yuen; and Manchsnda, Krisham Dayal, to Union Carbide Corporation. Desulfurization by selective adsorption with a crystalline zeolitic molecular siene. 3,620,969, Cl. 208-245.
Tutle, Edward G.: *See—*
Stickley, Beryl C.; and Tutle, Edward G.,3,621,112.
Tuzihara, Tosio: *See—*
Takeda, Naozi; and Tuzihara, Tosio,3,619,899.
Tyler, Reginald E. W.; and Carter, Paul M., to Durand Machine Works Ltd. Sheet handling apparatus. 3,620,527, Cl. 271-27.
Tylko, Jozef K., to Tetronics Research & Development Company, Ltd. Cleaning metal surfaces to remove grease films. 3,621,179, Cl. 219-121.
Tysk, Jan Erik; Olofsson, Sven Skalby; and Jacobson, Nils Bertil, to LKB Medical AB. Apparatus for peritoneal dialysis. 3,620,215, Cl. 128-213.
Tyson, W. Gerald: *See—*
Johnson, Kenneth R.; Tyson, W. Gerald; and Soroka, Joe F.,3,619,975.
Uchida, Toshiyuki; Miyakoshi, Hisashi; and Murai, Shinichi, to Kabushiki Kaisha Komatsu Seisakusho Minato-Ku. Control system for automatic operation of a press line. 3,621,348, Cl. 318-77.
Uchino, Koichi: *See—*
Yasuda, Kazuo; Uchino, Koichi; Nishiwaki, Koji; and Inomata, Hiroshi,3,620,628.
Udden, Per E. C.: *See—*
Linnman, Sven N. J.; and Udden, Per E. C.,3,621,363.
Udylite Corporation, The: *See—*
Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W., 3,620,813.
Ueda, Shizuma; and Fujimoto, Shigenobu, to Teijin Seiki Co., Ltd. Traversing mechanism in use for fast yarn winding. 3,620,464, Cl. 242-43.
Ugine Kuhlmann: *See—*
Jirou, Marcel Georges; and Brouard, Claude Marie Henri Emile, 3,621,006.
Lakodey, Andre; Mathais, Henri; and Weiss, Francis, 3,621,035.
Uhde, Friedrich, GmbH: *See—*
Peters, Henning; and Solmecke, Klaus-Dieter, 3,620,405.
Uhlig, Konrad: *See—*
Diehr, Hans Joachim; Merten, Rudolf; Piechota, Helmut; and Uhlig, Konrad,3,620,986.
Ulano, Bernard, to Diagravure Film Mfg. Corporation. Relief image process utilizing a simple and a complex ferric salt. 3,620,735, Cl. 96-36.
Ulion, Nicholas E.: *See—*
Blecherman, Sol S.; Bala, Mitchell J.; Evans, Dennis J.; and Ulion, Nicholas E.,3,620,815.
Ulry, David N. Keyboard player apparatus. 3,620,116, Cl. 84-111.
Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Tape cartridge loading device. 3,620,479, Cl. 242-198.
und Schiffahrt m.b.H.: *See—*
Drittler, Karl; and Luhleich, Hartmut, 3,620,835.
Union Carbide Corporation: *See—*
Hofer, Peter H., 3,621,092.
Johnson, Gordon C., 3,620,821.
Kupcikevicius, Vytautas, 3,619,974.
Starcher, Paul S.; Trecker, David; and McKeon, James E., 3,621,012.
Turnock, Philip Hain; Lee, Max Nai Yuen; and Manchsnda, Krisham Dayal, 3,620,969.
Uniroyal, Inc.: *See—*
Ariyan, Zaven S.; and Martin, Robert L., 3,621,032.
United Aircraft Corporation: *See—*
Barrow, Robert B.; and Hostetler, Jeffrey D., 3,620,288.
Blecherman, Sol S.; Bala, Mitchell J.; Evans, Dennis J.; and Ulion, Nicholas E., 3,620,815.
Phipps, Charles M., Jr., 3,620,289.
Urban, Louis A.; and Fortmann, William E., 3,620,011.
Wagner, David H.; Duhl, David N.; Van Der Molen, Edward H.; and Sullivan, Cornelius P., 3,620,855.
United Gas Industries Limited: *See—*
Bass, Patrick, 3,621,207.
United Kingdom Atomic Energy Authority: *See—*
Clayton, Colin Geoffrey; and Wladyslaw, Bohdan, 3,621,245.
United States Filter Corporation: *See—*
O'Cheskey, Theodore H., 3,621,173.
United States of America
Agriculture: *See—*
Hobart, Stanley R.; McGregor, Howard H., Jr.; and Mack, Charles H., 3,620,664.
Hunter, Irving R.; and Walden, Mayo K., 3,620,771.
Air Force: *See—*
Griest, Raymond H., 3,620,607.
Heller, Stanley; and Shapiro, Wilbur, 3,620,581.
Peters, Wendell R., 3,620,082.
Wise, Joseph F., 3,620,847.
Army: *See—*
Cason, Charles M., III; and Perkins, James F., 3,621,461.
Dreitzler, David R.; Thorn, Lawrence B.; and Yell, Roy E., 3,621,258.
Dunaway, J. C., 3,620,089.
Fix, Joseph O., 3,620,578.
Fruchnight, Ocke C., 3,620,939.
Lanier, Maceo M.; and Williams, Nathan P., 3,620,539.
Markow, Edward G., 3,620,278.
Reams, Robert B., Jr.; and Klute, Charles H., 3,620,623.
Rothwarf, Frederick, 3,621,472.
Wick, Reyburn, 3,620,940.
Wiese, Harold H., 3,620,124.
Willett, Colin S., 3,621,460.
Yates, Robert E.; and Ross, Lester M., 3,619,906.
Atomic Energy Commission: *See—*
Benham, Thomas H., 3,620,604.
Borkowski, Casimer J., 3,621,254.
Flaherty, Robert, 3,620,917.
Herchenroeder, Robert B.; Chow, Joe G. Y.; and Fleitman, Albert H., 3,620,852.
Higley, Wayne R.; Silcocks, Harry L.; and Waggoner, James A., 3,620,208.
Hilborn, John W.; Lennox, Colin G.; and Mathers, Wilson G., 3,620,916.
Isaacs, Hugh Solomun; and Singer, Robert M., 3,620,859.
Jalbert, Roland A.; and Hiebert, Richard D., 3,621,238.
Johnston, Phillip A.; and Gelezunas, Vincent L., 3,621,257.
Koprowski, Thomas J., 3,620,583.
Monroe, James E., Jr., 3,620,808.
Princiotta, Frank T.; and Barr, Harold N., 3,621,261.
Purcell, John R., 3,621,386.
Raynor, Gilbert S., 3,620,078.
Wilson, Archie S., 3,620,687.
Atomic Energy Commisson: *See—*
Alexeff, Igor; Neidigh, Rodger V.; and Wing, William Ray, 3,621,223.
Interior: *See—*
Harris, William B., Jr. (III); Harris, William B.; and Davison, Richard R., 3,620,206.
Khalafalla, Sanaa E.; and Payne, Sequoya L., 3,620,715.
National Aeronautics and Space Administration, Administrator, with respect to an invention of:
Clarke, David R. Thermal compression bonding of interconnectors. 3,619,896, Cl. 29-473.1
Habbal, Nazem A. System for quanitizing graphic displays. 3,621,130, Cl. 178-6.8
Hron, Roland L. Load current sensor for a series pulse width modulated power supply. 3,621,372, Cl. 323-17.
Johns, Carl E. Continuously variable voltage controlled phase shifter. 3,621,406, Cl. 328-155.
Kerwin, William J., and Shaffer, Charles V. Multiloop RC active filter apparatus having low parameter sensitivity with low amplifier gain. 3,621,407, Cl. 328-167.
Perlman, Marvin. Digital function generator. 3,621,228, Cl. 235-197.
Valentijn, Herman P. Deployable solar cell array. 3,620,846, Cl. 136-89.
Banta, Robert D. Positive contact resistance soldering unit. 3,621,193, Cl. 219-234.
Zidman, Michael J. Inflatable crib for babies. 3,619,825, Cl. 5-94.
National Aeronautics and: *See—*
Anderson, Karl F.; and Lynch, Thomas L., 3,621,285.
Anderson, William J.; and Coe, Harold H., 3,620,585.
Banks, Bruce A., 3,620,018.
Cancro, Ciro A., 3,621,277.
Cliff, Rodger A., 3,621,294.
Cole, Henry A., Jr., 3,620,069.
Dane, Dan H., 3,620,095.
Dimeff, John; and Lane, James W., 3,620,083.
Freche, John C.; and Waters, William J., 3,620,718.
Fryer, Thomas B., 3,621,290.
Heyson, Harry H., 3,620,076.
Krupnick, Albert C., 3,620,791.
Loop, Russell W.; Tongier, Max, Jr.; and Cone, Clarence D., Jr., 3,620,595.
Peterson, Victor S., 3,621,287.
Schutt, John B., 3,620,784.
Schwarz, Francisc, 3,621,362.
Tschunko, Hubert F. A., 3,620,606.
Vermillion, Clara M., 3,621,194.
Navy: *See—*
Barrett, Allan G.; and Albers, Francis L., 3,620,072.
Cunningham, James W.; and Douglas, George R., 3,620,061.
Driskell, Carl R., 3,621,128.
Dusheck, George J., Jr., 3,621,308.
Edwards, William R., 3,620,075.
Haas, Charles H., 3,621,282.
Hogge, Ernest A., 3,620,326.
Jakas, Rimvydas P.; and Mullin, Joseph V., 3,619,869.
King, Paul C., 3,620,162.
Kuntz, William K.; and Souviner, George E., 3,620,122.
Posey, Ken, Jr., 3,620,694.
Stanwood, Robert K., 3,621,136.

Taylor, James W.; and Pace, Robert E., 3,621,447.
Wolff, Hanns H., 3,621,131.
United States Steel Corporation: *See—*
Bills, Max E.; and Hansen, Henry J., Jr., 3,619,881.
Cutter, Paul R., 3,620,668.
Universal American Corporation: *See—*
Leming, Paul W.; and Flanigan, Richard J., 3,619,952.
Universal Coin Meter Company, Inc.: *See—*
Prescott, Bernard Clark, 3,620,342.
Universal Railway Devices Company: *See—*
Natschke, Eldred H., 3,620,098.
University of North Carolina, The: *See—*
Prange, Arthur J., Jr.; Wilson, Ian C.; and Lipton, Morris A., 3,621,096.
Upjohn Company, The: *See—*
McLaughlin, Alexander M.; and Rose, James S., 3,620,987.
Olson, Carter L., 3,620,675.
Urakami, Tamio: *See—*
Tanimoto, Katsukiyo; Urakami, Tamio; and Itadani, Sotaro,3,620,897.
Urban, Louis A.; and Fortmann, William E., to United Aircraft Corporation. Compressor pressure limiter for gas turbine engine. 3,620,011, Cl. 60-39.28
Urban, Stephen F.: *See—*
Pulvari, Charles F.; and Urban, Stephen F.,3,621,343.
Urch, Harvey M.: *See—*
Wenger, Jerry A.; Douglas, Daryl D.; Urch, Harvey M.; Nordman, Leonard; and Polivka, John N.,3,620,564.
U.S. Automation Company: *See—*
Borodin, Daniel J., 3,620,380.
U.S. Philips Corporation: *See—*
Bosma, Hendrik, 3,621,477.
Cacheux, Jean Antoine; and Meuleman, Johannes, 3,621,256.
Collet, Marnix Guillaume, 3,620,827.
Dijksterhuis, Popko Reinder; and Rust, Robert, 3,620,958.
Geominy, Louis Joseph Henri; Gommans, Hubertus Johannes Josephus; Mans, Leonardus Frans Helene; and Ruytenbeek, Silvester Marie, 3,621,203.
Jaspers, Hendrik Alphons; and Abrahams, Jacobus Hubertus, 3,620,652.
Kasperkovitz, Wolfdietrich, 3,621,345.
Tan, Sing Liong, 3,621,124.
Te Velde, Ties Siebolt, 3,620,832.
Teer, Kees; and Sangster, Frederik Leonard Johan, 3,621,283.
Van Nielan, Johannes A., 3,621,347.
Vermeijlen, Leopold Petrus Johannes; and Laa, Friedrich, 3,620,385.
U.S. Plywood-Champion Papers, Inc.: *See—*
Lawrence, Walter P., 3,620,910.
Usiak, Edwin P.; and Tucker, Albert C., to Wilson, Lee, Engineering Company. Apparatus for controlling flow to and from a blower. 3,620,515, Cl. 263-40.
USM Corporation: *See—*
Door, Wesley R., 3,620,108.
V-Mark Automation Ltd.: *See—*
Klein, Edward I., 3,620,264.
Vad, Laszlo: *See—*
Bartha, Zoltan; Vad, Laszlo; Biro, Imre; and Farkas, Otto,3,620,279.
Valchev, Alexander Yordanov; and Tashev, Kyril Hristov, to DMZ 'LENIN'. Sealing device for electrode holes in electric arc furnaces. 3,621,104, Cl. 13-9.
Valdes, Frederick J. Combined drawing board and container for artistic materials. 3,620,362, Cl. 206-1.7
Valdespino, Joe M., to Aquanox, Inc. Aerobic waste treatment system with automatic back flushing filter. 3,620,371, Cl. 210-117.
Valente, Raymond L., to Manco Manufacturing Co. Weld reducing method and apparatus. 3,621,176, Cl. 219-57.
Valentijn, Herman P.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,620,846.
Valentino, Carl R.: *See—*
Jen, Dian P.; Slocum, Richard A.; and Valentino, Carl R.,3,621,213.
Valet, Jean-Yves, to Commissariat a l'Energie Atomique. Anistropic thin ferromagnetic film magnetometer. 3,621,382, Cl. 324-43.
Valette, Henri L.: *See—*
De Gaston, Raoul Hugh, 3,620,494.
Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies): *See—*
Bro, Jacques, 3,620,503.
Vambutas, Edmundas: *See—*
Daly, Richard T.; and Vambutas, Edmundas,3,620,626.
VanAcker, John J., to Addressograph-Multigraph Corporation. Work arranging system (EMI). 3,620,624, Cl. 355-61.
Van Arsdale, Lyle R.; Lathrop, Francis M.; and Reaves, Vernon R., to M&J Valve Company. Pumping station by-pass system and method. 3,620,236, Cl. 137-13.
Van Beek, Herman W.: *See—*
Isett, Donald D.; Hellmer, Judy A.; and Van Beek, Herman W.,3,621,208.
Van Brandt, Rene Alois: *See—*
Poot, Albert Lucien; and Van Brandt, Rene Alois,3,620,741.
Van Damme, Frans M., to Research Corporation. Glass tube reforming apparatus. 3,620,707, Cl. 65-271.
Van Den Heuvel, Anthony P.: *See—*
Epstein, Max; Fryberger, David; Serafin, Robert J.; and Van Den Heuvel, Anthony P.,3,621,328.
van der Lely, Cornelis. Spreading implement with stabilized support frame. 3,620,459, Cl. 239-670.
Van Der Molen, Edward H.: *See—*
Wagner, David H.; Duhl, David N.; Van Der Molen, Edward H.; and Sullivan, Cornelius P.,3,620,855.
van der Vliet, Hendrik: *See—*
Selman, Jan; and van der Vliet, Hendrik,3,621,003.
Vandervort, Thomas L., to General Electric Company. Generator load control system. 3,621,370, Cl. 322-23.
Vanheertum, Johannes Josephus: *See—*
Tavernier, Bernard Hippoliet; de Jaeger, Nikolaas Cyriel; and Vanheertum, Johannes Josephus,3,620,721.
Willems, Jozef Frans; Noe, Robert Joseph; Vanheertum, Johannes Josephus; and Van Paesschen, August Jean,3,620,742.
Van Nielan, Johannes A., to U.S. Philips Corporation. Semiconductor device comprising a field effect transistor having an insulated gate electrode and circuit arrangement comprising such a semiconductor device. 3,621,347, Cl. 317-235.
Van Paesschen, August Jean: *See—*
Willems, Jozef Frans; Noe, Robert Joseph; Vanheertum, Johannes Josephus; and Van Paesschen, August Jean,3,620,742.
Van Thyne, Ray J.: *See—*
Rausch, John J.; and Van Thyne, Ray J.,3,620,816.
Van Uitert, Le Grand G.: *See—*
Singh, Shobha; and Van Uitert, Le Grand G.,3,621,340.
Van Winsen, Friedrich H.; Trachte, Kurt; and Haverbeck, Gunther, to Daimler-Benz Aktiengesellschaft. Suspension of steerable front wheels of motor vehicles. 3,620,548, Cl. 280-96.2
Vari-Light Corporation: *See—*
Baltzer, Donald H., 3,620,889.
Varrasso, Eugene C. Memory unit providing output over longer time periods than duration of individual input signals. 3,621,286, Cl. 307-238.
Varta Aktiengesellschaft: *See—*
Wicke, Ewald; and Kuessner, Albrecht, 3,620,844.
Vatne, Robert D.: *See—*
Berndt, Edward W.; and Vatne, Robert D.,3,621,095.
Vaughan Mfg. Co.: *See—*
Bump, Edward L., 3,620,466.
Vaught, Le Roy M.: *See—*
Brown, Harold L.; and Vaught, Le Roy M.,3,621,395.
Vaverek, Milton J. Scooter. 3,620,547, Cl. 280-87.04
VEB Reglerwerk Dresden: *See—*
Topfer, Heinz; and Rockstroh, Manfred, 3,620,252.
Veeder Industries Inc.: *See—*
Szeluga, Ludwick; Hoffman, Ernest G.; and Sabo, Roland S., 3,620,447.
Veith, Werner: *See—*
Heynisch, Hinrich; Bittorf, Hannjorg; and Veith, Werner,3,621,319.
Venables, Herbert J., III, to Venables Machine and Tool Company, The. Die assembler. 3,619,883, Cl. 29-200.
Venables Machine and Tool Company, The: *See—*
Venables, Herbert J., III, 3,619,883.
Ventre, Daniel B.: *See—*
La Rocco, Samuel S.; and Ventre, Daniel B.,3,620,148.
Ver Steeg, Melvin A., Jr.; and Spring, Ferdinand E., Jr., to Ralston Purina Company. Cook in the bowl cereal. 3,620,760, Cl. 99-80.
Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher 'Weser' Flugzeugbau/ Focke-Wulf/Heinkel-Flugzeugbau:*See—*
Fischer, Christoph, 3,620,487.
Vermeijlen, Leopold Petrus Johannes; and Laa, Friedrich, to U.S. Philips Corporation. Conveying apparatus for a magnetic tape cartridge changer. 3,620,385, Cl. 214-6.
Vermillion, Clara M., to United States of America, National Aeronautics and Space Administration. Resistance soldering apparatus. 3,621,194, Cl. 219-234.
Verstegen, Willi, to International Standard Electric Corporation. Telephone switching translator. 3,621,145, Cl. 179-18.
Vial, Michel, to Application des Gaz. Heating apparatus for caravans and the like. 3,620,205, Cl. 126-110.
Vibrac Corporation: *See—*
Hendershot, James R.; and Searle, Robert F., 3,620,335.
Victor Company of Japan, Limited: *See—*
Wada, Yoshiyo; and Yasutake, Katsuya, 3,621,149.
Victor Company of Japan, Ltd.: *See—*
Umeda, Hiroyuki, 3,620,479.
Victoreen Leece Neville, Inc.: *See—*
Gilchrist, Albert D.; and Woo, Chung H., 3,621,333.
Vidal, Jorge Argemi: *See—*
Lizotte, Albert R., Sr.; Vidal, Jorge Argemi; and Mackenzie, Albert H.,3,619,826.
Vidal , Jorge Argemi. Driving devices for toys. 3,619,939, Cl. 46-201.
Vie, Arnold M.: *See—*
Eilertson, Earl E., 3,620,226.
Viebrock, Frederick W.: *See—*
Harvey, Muerner S.; and Viebrock, Frederick W.,3,620,924.
Viesi, Aldo, to Grandi Padiglioni, S.p.A. Overhead covering in a dual cable system for polygonal, elliptical or circular plan buildings etc.. 3,619,958, Cl. 52-83.

Vilela, Antone. Golf course green or yard border cutter. 3,620,307, Cl. 172-15.

Vistron Corporation: *See—*
Partridge, Melvin H.; and Hargis, George R., III, 3,619,845.

Vito-Bil, Inc.: *See—*
D'Angelo, Vito, 3,620,232.

Voemel, Wolfgang: *See—*
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Voemel, Wolfgang; and Sauer, Winfriede,3,621,022.

Vogel, Charles B.; and Christensen, Alton O., to Shell Oil Company. Pulsed substrate transistor inverter. 3,621,292, Cl. 307-251.

Vogelsang, Paul G., Jr.: *See—*
Stanford, James R.; and Vogelsang, Paul G., Jr.,3,620,974.

Vogl, Norbert G., Jr.: *See—*
Jen, Teh-Sen; Pricer, Wilbur D.; and Vogl, Norbert G., Jr.,3,621,279.

Vogt, Johann: *See—*
Oppermann, Wilhelm; and Vogt, Johann,3,619,897.

Voith Getriebe KG: *See—*
Aramasow, Waldemar; Muller, Helmut; and Lindenthal, Hans, 3,620,319.
Armasow, Waldemar, 3,620,320.

Volkers, Stewart W., to Xerox Corporation. Sheet stripping apparatus. 3,620,615, Cl. 335-3.

Von Pless, James A.; and Cope, Richard P., Jr., to Stauffer Chemical Company. Method for obtaining a bright zinc coating by electrodeposition and the bath used therefor. 3,620,938, Cl. 204-55.

Von Starck, Axel, to AEG-Elotherm GmbH. Multiphase double-layer winding for electromagnetic pumps and conveyor troughs. 3,621,311, Cl. 310-13.

Von Willisen, Friedrick K., to Aktiengesellschaft Brown, Boveri & Cie. Arrangement for measuring a time variable magnetic using the Faraday effect. 3,621,390, Cl. 324-96.

Vora, Madhukar B.: *See—*
Chang, Joseph J.; and Vora, Madhukar B.,3,621,346.

Vulvan Equipment Company, Limited: *See—*
Bubik, Leslie, 3,620,393.

Vural, Bayram: *See—*
Hammer, Jacob Meyer; and Vural, Bayram,3,621,462.

Wada, Yoshiyo; and Yasutake, Katsuya, to Victor Company of Japan, Limited. Magnetic tape tension control system for magnetic recording and reproducing apparatus having dual capstans. 3,621,149, Cl. 179-100.2

Waddell, Raynor J.; and Eggler, Karl W. Re-sleeve assembly for shafts. 3,620,041, Cl. 64-1.

Waggoner, James A.: *See—*
Higley, Wayne R.; Silcocks, Harry L.; and Waggoner, James A.,3,620,208.

Waghorn, Leonard Cyril; and Turner, Peter Raymond, said Waghorn assor. to Smiths Industries Limited. Head-up display apparatus. 3,620,601, Cl. 350-174.

Wagner, David H.; Duhl, David N.; Van Der Molen, Edward H.; and Sullivan, Cornelius P., to United Aircraft Corporation. Superalloys incorporating precipitated topologically close-packed phases. 3,620,855, Cl. 148-32.5

Wagner, Otto; Bauer, Klaus; Kaufmann, Wilfried; Rauenbusch, Erich; Arens, Alfred; and Irion, Eckart, to Farbenfabriken Bayer Aktiengesellschaft. Process for the enrichment of L-asparaginase. 3,620,926, Cl. 195-66.

Wakely, Wilbur T.: *See—*
Rogers, Bryant C.; and Wakely, Wilbur T.,3,621,338.

Walde, Robert A.: *See—*
Erby, William A.; and Walde, Robert A.,3,619,991.

Walden, Mayo K.: *See—*
Hunter, Irving R.; and Walden, Mayo K.,3,620,771.

Walden, Robert H.: *See—*
Smith, George E.; and Walden, Robert H.,3,621,446.

Waldes, George, to Waldes Kohinoor, Inc. Readily engageable and disengageable fasteners. 3,620,180, Cl. 112-407.

Waldes Kohinoor, Inc.: *See—*
Waldes, George, 3,620,180.

Walker, Clifford R.: *See—*
Rideout, Gerald E.; and Walker, Clifford R.,3,619,850.

Walker, George Eden: *See—*
Henley, Eric Douglas; and Walker, George Eden,3,620,334.

Walker, Gordon Richard; and Murray, William, to Filton Limited. Rotary distributor. 3,620,253, Cl. 137-625.11

Walker, Jerome F.: *See—*
Grosvenor, Herbert D.; and Walker, Jerome F.,3,620,533.

Wall, Robert F., to Monsanto Company. Rotatable switch for providing electrical pulses and indicating the direction of switch rotation. 3,621,162, Cl. 200-61.39

Wallace, Charles H., to Schmidt-Wallace Inc. Method for producing skinless wieners. 3,620,766, Cl. 99-109.

Wallace, William R. J., to Hygrade Foods Inc. Processing of sausage-like products. 3,620,431, Cl. 226-109.

Wallis, Marvin E. Apparatus for producing plastic film. 3,619,860, Cl. 18-12.

Walsh, Arthur, to Xerox Corporation. Photoelectrophoretic imaging system employing preliminary electrophoretic disposition of the imaging suspension. 3,620,948, Cl. 204-181.

Walters, Glenn A. Multichannel rotary joint. 3,621,475, Cl. 333-1.

Walterskirchen, Wm. C.: *See—*
Huver, Ben, 3,620,493.

Walton, Richard S., to Hamilton Watch Company. Electronic timepiece construction employing a flat step-by-step electromechanical energy converter. 3,621,313, Cl. 310-49.

Ward, Delbert R.; and Rochelle, William R., to Brown & Root, Inc. Submergible flange coupling and gasket. 3,620,554, Cl. 285-18.

Warden, Merritt N.: *See—*
Huver, Ben, 3,620,493.

Waring, Richard J., to Magnavox Company, The. Low B^{α} start circuit for line operated receiver. 3,621,134, Cl. 178-7.3

Warner & Swasey Company, The: *See—*
Paepke, Horst, 3,620,047.

Warner, Richard H. Mine roof bolt assembly. 3,620,120, Cl. 85-76.

Warren, Glenn B.; and Morgan, John Randolph. Solid state multi-spark ignition system. 3,620,201, Cl. 123-148.

Warren, William E.: *See—*
Singleton, Ogle R., Jr.; Kesler, Sidney B., Jr.; and Warren, William E.,3,620,516.

Warwick Electronics Inc.: *See—*
Worster, Frederick E., 3,621,364.

Washizuka, Isamu; Yoshida, Kunio; Kunikane, Akihiko; and Kitagawa, Yoshinobu, to Hayakawa Denki Kogyo Kabushiki Kaisha. Arithmetic unit utilizing magnetic core matrix registers. 3,621,219, Cl. 235-170.

Wasser, Richard Barkman, to American Cyanamid Company. Preparation of aqueous solution of acrylamide containing no free oxygen and polymerization of acrylamide therein. 3,620,991, Cl. 260-29.6

Waste Paper Reclamation Corporation: *See—*
Gleason, C Roy, 3,620,909.

Watanabe, Hiromitsu, to Fuji Photo Film Co., Ltd. Automatic focusing device for projectors. 3,620,613, Cl. 353-101.

Watanabe, Hiroshi: *See—*
Goto, Tatsuo; Matsudo, Yoryo; and Watanabe, Hiroshi,3,621,351.

Watanabe, Yoshihiro; Kobayashi, Jiro; Toyoshima, Yoshiki; Tokumaru, Toor; and Saito, Masatosi, to Sumitomo Chemical Company, Ltd. Process for producing isoprene. 3,621,072, Cl. 260-681.

Waters, William J.: *See—*
Freche, John C.; and Waters, William J.,3,620,718.

Watkins, Harley E., to Pet Incorporated. Method of controlling the functional characteristics of flour by microwave treatment of grain. 3,620,764, Cl. 99-93.

Watson, Edward; Wilkins, Dennis M.; and Johnson, Ronald L., to Coal Industry (Patents) Limited. Intermittently moving conveyor apparatus for determining the moisture content of substances thereon. 3,621,379, Cl. 324-0.5

Watthey, Jeffrey W. H.; and Doebel, Karl J., to Geigy Chemical Corporation. Hypotensive methods and compositions utilizing hexahydro-benzo [b]quinolizines. 3,621,098, Cl. 424-258.

Watts, Ridley, Jr., to American Packaging Corporation. Heating element and packaging machine equipped therewith. 3,621,200, Cl. 219-377.

Wavre, Andre: *See—*
Rubner, Tibor; Wavre, Andre; and Bednarek, John H.,3,621,278.

Weatherhogg, Charles Brian, to Girling Limited. Fluid seals. 3,620,136, Cl. 92-151.

Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzenesulfonyl-ureas and process for their manufacture. 3,621,057, Cl. 260-553.

Weber, John F., Jr., to Edelmann, E., & Co. Locking cylinder. 3,620,056, Cl. 70-362.

Webster, Milo E., to Gillette Company, The. Aerosol valve with flexible housing. 3,620,422, Cl. 222-402.22

Wedco, Inc.: *See—*
Feder, Friedhelm R., 3,620,463.

Weedon, Gene C.: *See—*
Winckhofer, Robert C.; Weedon, Gene C.; and Collingwood, George H.,3,620,892.

Wegner, Albert: *See—*
Tunstall, Wilfred; and Wegner, Albert,3,619,934.

Wehde, Heinz; Schindler, Kurt; Rogge, Joachim; and Czinczel, Armin, to Teldix GmbH. Electronic control of vehicle brake system. 3,620,576, Cl. 303-21.

Weil, Edward D.; and Gomlak, Norman H., to Hooker Chemical Corporation. Polyvinylchloride stabilization with a lead salt. 3,620,994, Cl. 260-41.

Weimer, Ralph E.: *See—*
Schindler, James C.; Weimer, Ralph E.; and Herbert, Ronald M.,3,620,156.

Weinberger, Morris. Door check. 3,620,483, Cl. 292-262.

Weinman, A.G.: *See—*
Schoch, Robert, 3,619,871.

Weir, Fred Eugene: *See—*
Evans, Joseph H.; and Weir, Fred Eugene,3,620,406.

Weiss, Alvin Dennis: *See—*
Schroeder, Duane Arthur; Weiss, Alvin Dennis; and Giltner, Benedict Clare,3,620,840.

Weiss, Francis: *See—*
Lakodey, Andre; Mathais, Henri; and Weiss, Francis,3,621,035.

Weldotron Corporation: *See—*
Zelnick, Seymour, 3,619,970.

Welker, Jerry W., to Sperry Rand Corporation. Tine arch mechanism for a bale wagon. 3,620,384, Cl. 214-6.

Wells, Kenneth R., to Black and Decker Manufacturing Company, The. Handle height adjustment. 3,619,998, Cl. 56-249.

Welsch, Walter N.; and Buchman, Louis J., to Dynabrade, Inc. Miniature belt grinder. 3,619,949, Cl. 51-170.

Wendler, Friedrich: *See—*
Peehs, Martin; and Wendler, Friedrich,3,620,838.

Wenger Corporation: *See—*
Wenger, Jerry A.; Douglas, Daryl D.; Urch, Harvey M.; Nordman, Leonard; and Polivka, John N., 3,620,564.

Wenger, Jerry A.; Douglas, Daryl D.; Urch, Harvey M.; Nordman, Leonard; and Polivka, John N., to Wenger Corporation. Mobile center. 3,620,564, Cl. 296-23.

Wenner, John W., to International Business Machines Corporation. Magnetic read/write head with partial gap and method of making. 3,621,153, Cl. 179-100.2

Wenstrom, Roger A.: *See—*
Chou, Tien S.; Tonnell, Wilfred T.; and Wenstrom, Roger A.,3,620,882.

Wentland, Robert J., to Richardson Company, The. Construction of polyolefin containers. 3,620,402, Cl. 220-4.

Wenzel, James L.; and Clark, Lawrence Arthur, to General Electric Company. Generator shaft disconnect. 3,620,046, Cl. 64-28.

Wenzlaff, Karl, to Glasrock Products, Inc. Jet engine noise suppressor. 3,620,329, Cl. 181-33.

Werdouschegg, Fritz M. K.; and Windhager, Robert H., to Calgon Corporation. Process for producing pigmented electroconductive coating compositions. 3,620,828, Cl. 117-201.

Wergin, Paul C.: *See—*
Hudnall, Joseph R.; and Wergin, Paul C.,3,621,441.

Wernicke, Hans-Joachim, to Wesser Griesheim GmbH. Method and machine for the rapid heating of tubes. 3,620,513, Cl. 263-4.

Wernlund, Roger F.: *See—*
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D.,3,621,240.

Wessel, Wolf, to Bosch, Robert, G.m.b.H. Arrangement for applying fuel injection corrections as a function of speed, in internal combustion engines. 3,620,196, Cl. 123-32.

Wesser Griesheim GmbH: *See—*
Wernicke, Hans-Joachim, 3,620,513.

Westby, Kenneth, to Thomas Industries Inc. Connector and conduit and method of manufacture. 3,621,113, Cl. 174-51.

Westcott, Paul W.: *See—*
Hwoschinsky, Vladimir; Nelson, James E.; and Westcott, Paul W.,3,620,683.

Western Electric Company, Incorporated: *See—*
Hudnall, Joseph R.; and Wergin, Paul C., 3,621,441.

Western Geophysical Company of America: *See—*
Savit, Carl H., 3,620,327.

Western Offshore Drilling & Exploration Company: *See—*
Wilde, Arthur E., 3,620,028.

Westinghouse Air Brake Company: *See—*
Feucht, Jacob E., 3,620,133.
Gonski, Joseph, 3,620,345.
Hylen, Lyle L., 3,621,237.

Westinghouse Electric Corporation: *See—*
Benke, Frank W., 3,621,429.
Bennon, Saul; and Moore, Harold R., 3,621,426.
Bennon, Saul, 3,621,427.
Brandt, Gerald B., 3,620,598.
Cleaveland, Charles M., 3,621,108.
Farmer, Robert S., Sr., 3,620,395.
Fink, Joel H., 3,621,324.
Foster, Karl; and Seidel, Joseph, 3,620,779.
Hodgson, Alfred W., 3,621,339.
Horsey, William C.; Samson, Robert H.; and McCauley, Don O., 3,621,246.
Johnston, Robert L.; and Chambers, Wallace G., 3,621,428.
Kappenhagen, George A., 3,621,337.
Kennedy, Paul G., 3,621,408.
Kerr, Robert E., 3,621,317.
Lide, Basil M., 3,621,247.
Misencik, John J., 3,621,269.
Peterson, Noel C.; and Klein, Gerald I., 3,621,479.
Reichner, Philip, 3,620,931.
Rubner, Tibor; Wavre, Andre; and Bednarek, John H., 3,621,278.
Scott, Eugene W.; and Chapin, Roger F., Jr., 3,620,452.
Snyder, Carl J., 3,621,271.

Weston, Francis Anthony: *See—*
Keen, John Michael Storer; Byett, Maurice John; and Weston, Francis Anthony,3,620,641.

Weston Instruments, Inc.: *See—*
Pignolet, Louis W., 3,621,393.

Westra, Simon, to Shell Oil Company. Single buoy mooring for use in loading and unloading ship. 3,619,832, Cl. 9-8.

Westvaco Corporation: *See—*
Kohne, Harry F., Jr.; and Kurrle, Frederick L., 3,620,806.

Wetzstein, Hanns J., to American Cyanamid Company, mesne. Coding of symbols with photoluminescent materials for readout to obtain proper sequence signal readout from random reading of symbols. 3,621,250, Cl. 250-71.

Weyer, Rudi: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut,3,621,057.

Wheaton, Harold L.; and Pekarek, Edward G., to TRW Inc. Method of vacuum refining high temperature alloys. 3,620,719, Cl. 75-170.

Whirlpool Corporation: *See—*
Drews, Reinhold A.; and Trembath, Robert S., 3,620,054.

Whirpool Corporation: *See—*
Clearman, Jack F.; Ohlsson, Leonard W.; and Sitko, Robert H., 3,620,040.

White, Brian Graham, to Imperial Chemical Industries Limited. Herbicidal process and compositions for use therein. 3,620,711, Cl. 71-94.

White, Chester N.; and Freedman, Philip D., to Great Canadian Oil Sands Limited. Method of determining processability of for sands. 3,621,260, Cl. 250-106.

White, George R.; and Griffin, Gordon R., to Xerox Corporation. Off-center focusing system. 3,620,603, Cl. 350-247.

White, John D., to Celanese Coatings Company. Black anti-fouling coating compositions. 3,620,943, Cl. 204-148.

White, Joseph G.: *See—*
Burum, Harold J., 3,619,947.

White, Lawrence E.: *See—*
Comis, William P.; and White, Lawrence E.,3,620,368.

White, Walter R., to Eastman Kodak Company. Subbing solution comprising polyvalent metal chloride salts and a swelling agent. 3,620,790, Cl. 106-287.

White, William T., to Xerox Corporation. Multiple input copying apparatus. 3,620,618, Cl. 355-6.

Whitney, Alan G.: *See—*
DeKalb, Arthur; and Whitney, Alan G.,3,620,702.

Whittier, John D.: *See—*
Studebaker, James B.; Minick, George A.; and Whittier, John D.,3,620,642.

Whittington, Keith R., to T. I. (Group Services) Limited. Optical gauges. 3,620,629, Cl. 356-160.

Wiberley, James S.: *See—*
Lineberger, Robert O.; Wiberley, James S.; and Griffin, Joseph R.,3,620,803.

Wick, Reyburn, to United States of America, Army. Method of inducing polarization of active magnesium surfaces. 3,620,940, Cl. 204-56.

Wicke, Ewald; and Kuessner, Albrecht, to Varta Aktiengesellschaft. System for the activation of hydrogen. 3,620,844, Cl. 136-86.

Wieck, Gregory J., to Battelle Development Corporation. Irrigation apparatus. 3,620,250, Cl. 137-561.

Wienand, Michael, to Dynamit Nobel Aktiengesellschaft. Device for manufacturing plastic foils, strips and the like. 3,619,856, Cl. 18-2.

Wiener Metallwarenfabrik Smolka & Co.: *See—*
Smolka, Thomas G., 3,619,837.

Wiersma, Fonger: *See—*
Bryndza, Robert M.; and Wiersma, Fonger,3,621,464.

Wiese, Harold H., to United States of America, Army. Firing mechanism for reversible automatic cannon. 3,620,124, Cl. 89-13.

Wiggins Teape Research & Development Limited: *See—*
O'Grady, Michael Hugh, 3,620,801.

Wilde, Arthur E., to Western Offshore Drilling & Exploration Company. Pipe lay down apparatus. 3,620,028, Cl. 61-72.3

Wilde, Geoffrey Light, to Rolls-Royce Limited. Gas turbine power plant. 3,620,009, Cl. 60-39.16

Wilde, Geoffrey Light, to Rolls-Ramo Limited. Gas turbine engine combustion equipment. 3,620,012, Cl. 60-39.36

Wiley, David; and Allport, Maurice James, to Lucas, Joseph, (Industries) Limited. Battery charging system for a road vehicle with generator field controlled by a thyristor. 3,621,360, Cl. 320-48.

Wilfley, A. R., and Sons, Inc.: *See—*
Studebaker, James B.; Minick, George A.; and Whittier, John D., 3,620,642.

Wilken, Gerd: *See—*
Hinrichs, Kurt; and Wilken, Gerd,3,621,358.

Wilkins, Dennis M.: *See—*
Watson, Edward; Wilkins, Dennis M.; and Johnson, Ronald L.,3,621,379.

Willems, Jozef Frans; Noe, Robert Joseph; Vanheertum, Johannes Josephus; and Van Paesschen, August Jean, to Gevaert-Agfa N.V. Photoconductive element containing a dihydro- quinoline polymer. 3,620,742, Cl. 96-1.6

Willett, Colin S., to United States of America, Army. Sputtered vapor laser. 3,621,460, Cl. 331-94.5

Williams, Darrell W.: *See—*
Brown, Morton E.; Williams, Darrell W.; and Crownover, Albert B., Jr.,3,620,077.

Williams, Digby F.; and Schadt, Martin, to Canadian Patents and Development Limited. Electroluminescent device with light emitting aromatic hydrocarbon material. 3,621,321, Cl. 313-108.

Williams, Fred H.: *See—*
Link, Donald A.; Hubertus, Wash; and Williams, Fred H.,3,621,189.

Williams, John A., to Carrier Corporation. Evaporator coil package. 3,620,039, Cl. 62-354.

Williams, Keith Vaughan: *See—*
McGrath, Brian Patrick; and Williams, Keith Vaughan,3,621,073.

Williams, Nathan P.: *See—*
Lanier, Maceo M.; and Williams, Nathan P.,3,620,539.

Williams, Wayne E.: *See—*
Rush, David H.; and Williams, Wayne E.,3,621,383.

Williger, Ervin J., to General Tire & Rubber Company, The. Plastic laminate structure having elastomer particles in alternate layers. 3,620,900, Cl. 161-162.

Willis Bros., Inc.: *See—*
Willis, Elmer Dryden, 3,619,855.

Willis, Elmer Dryden, to Willis Bros., Inc. Scallop processing. 3,619,855, Cl. 17-74.

Willis, John George, to Solid State Technology, Inc. Emergency transmitter power supply. 3,621,398, Cl. 325-119.

Willson, Karl S., to Kewanee Oil Company. Process of black chromium plating. 3,620,935, Cl. 204-38.

Wilson, Archie S., to United States of America, Atomic Energy Commission. Organic phase reduction of plutonium in a purex type process. 3,620,687, Cl. 23-341.

Wilson, David A.: *See—*
Pringle, Frank E.; Wilson, David A.; and Cochrane, Richard H.,3,619,972.

Wilson, Floyd A.: *See—*
Bunish, Steve; Wilson, Floyd A.; and Hansen, Theodore E.,3,621,118.

Wilson, Ian C.: *See—*
Prange, Arthur J., Jr.; Wilson, Ian C.; and Lipton, Morris A.,3,621,096.

Wilson, Jean B.; and Angerer, Dell Y. Chair-boat structure. 3,620,570, Cl. 297-448.

Wilson, Jim D.: *See—*
Beelik, Andrew; and Wilson, Jim D.,3,620,912.

Wilson, Lee, Engineering Company: *See—*
Usiak, Edwin P.; and Tucker, Albert C., 3,620,515.

Wilt, Larry John: *See—*
Geckle, Raymond James; and Wilt, Larry John,3,620,839.

Wincklhofer, Robert C.; Weedon, Gene C.; and Collingwood, George H., to Allied Chemical Corporation. Dimensionally stable articles and method of making same. 3,620,892, Cl. 161-89.

Windhager, Robert H.: *See—*
Werdouschegg, Fritz M. K.; and Windhager, Robert H.,3,620,828.

Windholz, Thomas B.: *See—*
Jensen, Norman P.; and Windholz, Thomas B.,3,621,036.

Wing, William Ray: *See—*
Alexeff, Igor; Neidigh, Rodger V.; and Wing, William Ray,3,621,223.

Winget Limited: *See—*
Brown, David J. B., 3,620,551.

Winkelmann, Ehardt; and Raether, Wolfgang, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Formamidine compounds of diphenyl-sulfone. 3,621,013, Cl. 260-239.6

Winkelmann, Jurgen: *See—*
Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried,3,620,167.

Winkler, Julius G., to Compo Industries, Inc. Last with detachable heel core. 3,619,838, Cl. 12-135.

Winter, Karl-Heinz; and Krach, Ottwin, Wolfgang Bei, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process and device for the treatment of surfaces of workpieces in an annealing furnace. 3,620,518, Cl. 263-15.

Winter, Richard: *See—*
Reichelt, Bernhard; and Winter, Richard,3,621,187.

Wippel, Hans Guenter: *See—*
Hahn, Erwin; and Wippel, Hans Guenter,3,621,007.

Wise, Joseph F., to United States of America, Air Force. Silicon solar cell array hardened to space nuclear blast radiation. 3,620,847, Cl. 136-89.

Wise, Layton A., to Mine Safety Appliances Company. Easy open sealed container. 3,620,407, Cl. 220-46.

Wiseman, Ben W., Jr. Device for putting out oil well fires. 3,620,299, Cl. 166-0.5

Wishnie, Frederick T.: *See—*
Broderick, John P.; Wishnie, Frederick T.; and Keys, Dón L.,3,620,454.

Wisseman, William R., to Texas Instruments, Incorporated. Traveling high gain amplifier. 3,621,411, Cl. 330-5.

Wiswell, George C., Jr. Cable protection and method. 3,620,861, Cl. 156-53.

Wittlinger, Harold Allen, to RCA Corporation. Analog multiplier in which one input signal adjusts the transconductance of a differential amplifier. 3,621,226, Cl. 235-194.

Wittmoser, Adalbert: *See—*
Hofmann, Richard; and Wittmoser, Adalbert,3,619,866.
Hofmann, Richard; and Wittmoser, Adalbert,3,620,286.

Witucki, Ralph E.: *See—*
Conklin, Robert M.; and Witucki, Ralph E.,3,620,537.

Witzel, Homer D.; and Olieman, Pieter F., to Deere & Company. Crop agitator for the separating mechanism of agricultural combines and the like. 3,620,223, Cl. 130-22.

Wladyslaw, Bohdan: *See—*
Clayton, Colin Geoffrey; and Wladyslaw, Bohdan,3,621,245.

Woerner, Rudolph C.: *See—*
Tschopp, Lloyd D.; and Woerner, Rudolph C.,3,620,930.

Wohrle, Rudolf: *See—*
Eggenmuller, Alfred; Scherer, Lorenz; Bellan, Heinrich; and Wohrle, Rudolf,3,619,995.

Wolff, Hanns H., to United States of America, Navy. Visual environment simulator. 3,621,131, Cl. 178-6.8

Wong, Hans K., to Itek Corporation. Dye transfer color photography. 3,620,738, Cl. 96-48.

Woo, Chung H.: *See—*
Gilchrist, Albert D.; and Woo, Chung H.,3,621,333.

Wood Industries, Inc.: *See—*
Ricards, Charles L., 3,620,292.

Wood, James B., to GRT Corporation. Frequency selective audio limiter. 3,621,151, Cl. 179-100.2

Wood, Kenneth D. Separator means for combines. 3,619,997, Cl. 56-14.6

Wood, Robert; and Rouse, Paul B., to Garber, A. L., Company. Means to reduce delamination of cartons having removable access panels. 3,620,438, Cl. 229-51.

Woodcock, Richard W.; and Yackel, John P., to American Guidance Service, Inc. Display device. 3,620,552, Cl. 281-33.

Woodman Company, Inc., The: *See—*
Henry, Nelson R.; and Middour, Donald R., 3,620,316.

Worster, Frederick E., to Warwick Electronics Inc. Faulty electrical component sensing and protection apparatus. 3,621,364, Cl. 321-11.

Wortzman, Donald, to International Business Machines Corporation. Linear interpolator. 3,621,216, Cl. 235-151.11

Wright, Charles S. Variable resistors. 3,621,438, Cl. 335-150.

Wright, Eric S. Apparatus for extraction of drugs and toxic substances for blood, serum and other liquid. 3,620,681, Cl. 23-267.

Wright, Harry: *See—*
Henkel, Neville T.; Wright, Harry; and Scharer, Herman W.,3,620,066.

Wright, John H.; and Hajjar, Abraham L., to General Electric Company. Methyl silicone grease composition and method of making same. 3,620,976, Cl. 252-42.1

Wright, Lee A., to Mosier Industries, Inc. Machine control system. 3,620,016, Cl. 60-54.5

Wright, Richard H., Jr. Adjustable clean-out cover. 3,620,257, Cl. 138-89.

Wu, Charles T., to BLH Electronics, Inc. Strain gage with built-in dummy gage. 3,621,436, Cl. 338-3.

Wunderlich, Donald K.; Carleton, Finis E.; and Brownscombe, Eugene R., to Atlantic Richfield Company. Apparatus and method for producing hydrogen. 3,620,697, Cl. 48-89.

Wyatt, Jethro T.; and Litzinger, Gerald E. Toilet paper holder. 3,620,465, Cl. 242-55.2

Wyatt, William K., to Turbo Machine Company. Yarn twisting apparatus. 3,620,000, Cl. 57-34.

Wyeth, John, & Brother Limited: *See—*
Newberry, Robert Anthony, 3,621,028.

Wygant, James C., to Monsanto Company. Method for preparing α,α'-dicumyl from α-cumene hydroperoxide. 3,621,069, Cl. 260-668.

Wyland, J.W., & Sons, Inc.: *See—*
Wyland, Roy Bruce, 3,620,347.

Wyland, Roy Bruce, to Wyland, J.W., & Sons, Inc. Egg handling equipment. 3,620,347, Cl. 198-25.

Wylie, Chris R.: *See—*
Romney, Gordon W.; Evans, David C.; Erdahl, Alan C.; Wylie, Chris R., deceased; and Wylie, Patricia A.; administratrix,3,621,214.

Wylie, Patricia A.: *See—*
Romney, Gordon W.; Evans, David C.; Erdahl, Alan C.; Wylie, Chris R., deceased; and Wylie, Patricia A.; administratrix,3,621,214.

Xerox Corporation: *See—*
Brown, Stewart C., 3,621,288.
Davidson, James R.; and Lagonegro, Paul R., 3,620,616.
Keller, Carol K.; and Forest, Edward, 3,620,950.
Lyles, James M., 3,620,191.
Mack, Donald E., 3,621,141.
Regensburger, Paul J., 3,621,248.
Tamai, Yasuo; and Honjo, Satoru, 3,620,800.
Volkers, Stewart W., 3,620,615.
Walsh, Arthur, 3,620,948.
White, George R.; and Griffin, Gordon R., 3,620,603.
White, William T., 3,620,618.

Yabase, Koji, to Denki Onkyo Co., Ltd. Deflection yoke. 3,621,416, Cl. 335-212.

Yackel, John P.: *See—*
Woodcock, Richard W.; and Yackel, John P.,3,620,552.

Yada, Hiroshi: *See—*
Sekino, Shozo; Fujishima, Toshiyuki; and Yada, Hiroshi,3,620,717.

Yamada, Kazuo. Apparatus for locating a short circuit in a D.C. wiring. 3,621,384, Cl. 324-52.

Yamagishi, Hitoshi: *See—*
Tanaka, Yukio; Mizushina, Jun; Yamagishi, Hitoshi; and Kosaki, Hiroshi,3,621,102.

Yamaguchi, Nario; and Tubuko, Kazuo, to Kabushiki Kaisha Ricoh. Electrophotographic copying material containing assistant sensitizers and its manufacturing method. 3,620,723, Cl. 96-1.5

Yamaguchi, Yuzo: *See—*
Moroe, Tatsuo; Hattori, Satohiko; Komatsu, Akira; and Yamaguchi Yuzo,3,620,918.

Yamamoto, Yoshio: *See—*
Yoshimura, Susumu; Hasegawa, Katsue; Yamamoto, Yoshio; and Tajima, Iwao,3,621,342.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Murakami, Masuo; Iwanami, Masaru; Kubo, Kazuo; Sano, Kenji; Kochiya, Mashiro; and Arima, Hideki, 3,621,058.

Yasuda, Kazuo; Uchino, Koichi; Nishiwaki, Koji; and Inomata, Hiroshi, to Hitachi, Ltd. Photoelectric sample measuring apparatus. 3,620,628, Cl. 356-87.

Yasutake, Katsuya: *See—*
Wada, Yoshiyo; and Yasutake, Katsuya,3,621,149.
Yates, Michael Richard: *See—*
Edgar, Owen Burchell; and Yates, Michael Richard,3,621,089.
Yates, Robert E.; and Ross, Lester M., to United States of America, Army. Oscillating north-seeking platform. 3,619,906, Cl. 33-226.
Yawata Iron & Steel Co. Ltd.: *See—*
Akuta, Tomohiko; Honsyo, Yoshio; and Hashirizaki, Shinya, 3,621,266.
Sekino, Shozo; Fujishima, Toshiyuki; and Yada, Hiroshi, 3,620,717.
Yell, Roy E.: *See—*
Dreitzler, David R.; Thorn, Lawrence B.; and Yell, Roy E.,3,621,258.
Yeomans, Kenneth A.: *See—*
Sabatini, Bruno; and Yeomans, Kenneth A.,3,620,058.
Yokokawa, Sumio: *See—*
Nagae, Masaomi; and Yokokawa, Sumio,3,621,369.
Yokoyama, Giichi; and Kameoka, Yoshihisa, to Hewlett-Packard Company. Frequency multiplier. 3,621,451, Cl. 331-11.
Yokoyama, Katsuyoshi: *See—*
Hasegawa, Kazuaki; Nozaki, Kanzo Kawaguchi; and Yokoyama, Katsuyoshi,3,620,281.
Yokoyama, Takeo; and Kitamura, Hiroshi, to Mitsumi Electric Company Ltd. Electric-mechanical transducer. 3,621,309, Cl. 310-8.7
Yoshida, Kunio: *See—*
Washizuka, Isamu; Yoshida, Kunio; Kunikane, Akihiko; and Kitagawa, Yoshinobu,3,621,219.
Yoshida, Teruo; Sagara, Takaaki; Ojima, Takashi; Takahashi, Reiji; and Takahashi, Masahiro, to Ajinomoto Co., Inc. Process for producing enriched artificial rice. 3,620,762, Cl. 99-83.
Yoshihara, Toshio: *See—*
Okabe, Masanaga; Yoshihara, Toshio; and Hamaoka, Kenji,3,620,777.
Yoshimura, Susumu; Hasegawa, Katsue; Yamamoto, Yoshio; and Tajima, Iwao, to Matsushita Electric Industrial Company, Limited. Solid electrolytic capacitor with 3-MnO_2 electrolyte. 3,621,342, Cl. 317-230.
Yoshioka, Yoshio, to Hitachi, Ltd. Gas blast circuit breaker with puffer piston having an electrodynamic assist in the form of axially overlapping coils. 3,621,171, Cl. 200-148.
Yost, Jack L.: *See—*
Collins, Wilbur W.; and Yost, Jack L.,3,619,844.
Young, Charles Gilbert, to American Optical Corporation. Laser patern generator. 3,621,181, Cl. 219-121.
Young, Charles Gilbert. Disc laser system. 3,621,456, Cl. 331-94.5
Young, Clyde L., to Ramco Incorporated. Compressor reset delay circuit. 3,620,037, Cl. 62-158.
Young, Evan Johnson; and Summers, Charles Gene, to Monsanto Company. Asymmetrical phenolic non-discoloring antidegradants for polymers. 3,620,980, Cl. 252-404.
Young, Harvey Theodore: *See—*
Stevens, Frank W.; and Young, Harvey Theodore,3,620,418.
Young, Walter J., Jr., to Sierra Research Corporation. Frequency spectrum responsive noise reduction system. 3,621,401, Cl. 325-473.
Young, William L., III: *See—*
Klug, Eugene D.; Spurlin, Harold M.; and Young, William L., III,3,620,970.
Youngman, Derek Henry; and Davies, Robert William, to Molins Organisation Limited, The. Method for producing tear-strips. 3,620,874, Cl. 156-270.
Yu-Wen Jen, Timothy; and Loev, Bernard, to Smith Kline & French Laboratories. Imidazo and pyrimido [2,1-b] quinazoline compounds. 3,621,025, Cl. 260-256.4
Yuan, Edward L., to Du Pont de Nemours, E. I., and Company. Laminate with layers of polyimide and polyamide. 3,620,907, Cl. 161-227.
Yuki, Kazuo: *See—*
Shimamura, Masaharu; Minakuchi, Hideharu; Sakai, Hiroshi; Kuwabara, Tsutomu; Yuki, Kazuo; Okawa, Takao; and Abe, Tamio,3,621,087.
Yusawa, Kenji: *See—*
Ishidate, Morizo; and Yusawa, Kenji,3,621,005.
Z-Loc Block Co., Inc.: *See—*
Gregoire, Resta S., 3,619,935.
Zaiden Hojin Tokyo Seikagaku: *See—*
Ishidate, Morizo; and Yusawa, Kenji, 3,621,005.
Zatopek, Edward J.; and Bitting, James L., to Ethyl Corporation. Sealed ball valve. 3,620,243, Cl. 137-246.22
Zaugg, Roland, to Centre Electronique Hologer S.A. Calendar watch setting mechanism. 3,620,006, Cl. 58-58.
Zbikowski, Theodore H.: *See—*
Good, Thomas W.; and Zbikowski, Theodore H.,3,619,940.
Zecher, Wilfried: *See—*
Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberhart; and Zecher, Wilfried,3,621,000.
Zeidler, Adolf; Koenig, Karl-Heinz; Fischer, Adolf; and Jung, Johann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Salts of thiadiazinones. 3,621,017, Cl. 260-243.
Zelnick, Seymour, to Weldotron Corporation. Automatic method and apparatus for the wrapping of articles. 3,619,970, Cl. 53-30.
Zenith Carburetter Company Limited, The: *See—*
Ross, Gray E. D., 3,620,202.
Zenith Radio Corporation: *See—*
Adler, Robert, 3,621,482.
Zidman, Michael J.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,619,825.
Zieg, Wilhelm; Schmidt, Georg; Hauck, Edgar; Massell, Ingo; and Gruebel, Gustav, to Frankische Isolierrohr-und Metallwaren-Werke Gebr. Kirchner. Apparatus for making perforations in corrugated tubes. 3,620,115, Cl. 83-226.
Ziegler, Karl; and Eisenbach, Wilhelm, said Eisenbach assor. to said Ziegler. Electrolytic cells. 3,620,954, Cl. 204-206.
Zimmermann, Hubert: *See—*
Krusche, Kurt; and Zimmermann, Hubert,3,619,846.
Zimmie, William E. Method of removing tubercles from a ferrous surface and inhibiting further tubercle formation thereon. 3,620,667, Cl. 21-2.7
Zschocke, Albrecht: *See—*
Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht,3,621,055.
Zubryckyj, Nicolas; and Evans, David John Ivor, to Sherrit Gordon Mines Limited. Production of nickel sulphamate. 3,620,669, Cl. 23-114.
Zucchinelli, Mario: *See—*
Porta, Paolo della; Giorgi, Tiziano A.; Kindl, Bruno Milan; and Zucchinelli, Mario,3,620,645.
Zuech, Alphonse: *See—*
Jacques, Gabriel; Zuech, Alphonse; Convers, Alain; and Paumier, Jacques,3,621,068.
Zysman, George Isaac: *See—*
Johnson, Arlen Kent; and Zysman, George Isaac,3,621,478.

LIST OF DESIGN PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF NOVEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ampex Corp. : *See*—
Sanderson, Leon C., and Crouch. 222,622.

Arthur Salm Inc. : *See*—
Stahel, Alwin J. 222,603.

Ascani, Donald O. and J. R. Cycle wheel ornament or the like. 222,618, 11–16–71, Cl. D14—30.

Ascani, Joseph R. : *See*—
Ascani, Donald O. and J. R. 222,618.

Beckman, Glenn B., to Corning Glass Works. Mug. 222,628, 11–16–71, Cl. D44—9.

Borten, Charles H. Garment hanger carrier. 222,604, 11–16–71, Cl. D8—154.

Bott, John A. Luggage rack. 222,617, 11–16–71, Cl. D14—27.

Brown, Warner K., and D. C. Fuller, Lift truck. 222,614, 11–16–71, Cl. D14—3.

Callahan, Francis J., Jr., and S. Matousek, to Whitey Research Tool Co. Valve operating handle. 222,620, 11–16–71, Cl. D23—29.

Cohn, Irwin. Coin bank or similar article. 222,625, 11–16–71, Cl. D34—11.

Cohn, Irwin. Coin bank or similar article. 222,626, 11–16–71, Cl. D34—11.

Cohn, Irwin. Coin bank or similar article. 222,627, 11–16–71, Cl. D34—11.

Corning Glass Works : *See*—
Beckman, Glenn B. 222,628.

Crouch, David R. : *See*—
Sanderson, Leon C., and Crouch. 222,622.

Dawson, Robert E., E. J. Nitsch, and J. F. Stahl, to R. E. Dietz Co. Combined park, turn signal and side marker light. 222,630, 11–16–71, Cl. D48—32.

Dietz, R. E., Co. : *See*—
Dawson, Robert E., Nitsch, and Stahl. 222,630.

Francis, John P. Automobile rain visor for drive-in theatres. 222,616, 11–16–71, Cl. D14—6.

Fuller, Darrell C. : *See*—
Brown, Warner K., and Fuller. 222,614.

GTE Laboratories Inc. : *See*—
Sherman, Bennett, and Spillman. 222,621.

Gaudry, Paul E. Vacuum cleaner accessory nozzle. 222,631, 11–16–71, Cl. D49—19.

Gianfagna, John L. Table. 222,624, 11–16–71, Cl. D33—14.

Grosshans, George N., and R. E. Hobbs, to Owens-Illinois, Inc. Jug. 222,608, 11–16–71, Cl. D9—42.

Hassell, Jon, to Light Years Inc. Kinetic screen or similar article. 222,629, 11–16–71, Cl. D48—16.

Hickmann, Horst R., to Joseph V. Wilson. Trailer. 222,615, 11–16–71, Cl. D14—3.

Hobbs, Raymon E. : *See*—
Grosshans, George N., and Hobbs. 222,608.

Krusko, Evelyn H., to Scott Paper Co. Disposable diapers. 222,632, 11–16–71, Cl. D83—1.

Light Years Inc. : *See*—
Hassell, Jon. 222,629.

Lovitz, David D., to Sternco Industries, Inc. Combined filter and pump for aquariums. 222,619, 11–16–71, Cl. D23—4.

Marg, Joseph. Combined pour spout and hanger for a container. 222,612, 11–16–71, Cl. D9—290.

Marg, Joseph. Combined pour spout and hanger for a container. 222,613, 11–16–71, Cl. D9—290.

Matousek, Stephen : *See*—
Callahan, Francis J., Jr., and Matousek. 222,620.

Nitsch, Edward J. : *See*—
Dawson, Robert E., Nitsch, and Stahl. 222,630.

Owens-Illinois, Inc. : *See*—
Grosshans, George N., and Hobbs. 222,608.
Plummer, James E. 222,609.
Plummer, James E. 222,610.
Strand, Gordon A. 222,606.
Strand, Gordon A. 222,611.
Weckman, Richard L. 222,605.
Weckman, Richard L. 222,607.

Plummer, James E., to Owens-Illinois, Inc. Bottle. 222,609, 11–16–71, Cl. D9—70.

Plummer, James E., to Owens-Illinois, Inc. Bottle. 222,610, 11–16–71, Cl. D9—137.

Sanderson, Leon C., and D. R. Crouch, to Ampex Corp. Cassette transport. 222,622, 11–16–71, Cl. D26—14.

Scott Paper Co. : *See*—
Krusko, Evelyn H. 222,632.

Sherman, Bennett, and G. J. Spillman, to GTE Laboratories Inc. Infrared microscope. 222,621, 11–16–71. Cl. D26—5.

Simpson, Idolee. Combined bird feeder and waste food drier. 222,623, 11–16–71, Cl. D30—14.

Spillman, Gerard J. : *See*—
Sherman, Bennett, and Spillman. 222,621.

Stahel, Alwin J., to Arthur Salm Inc. Game shears. 222 603, 11–16–71, Cl. D8—52.

Stahl, John F. : *See*—
Dawson, Robert E., Nitsch, and Stahl. 222,630.

Sternco Industries, Inc. : *See*—
Lovitz, David D. 222,619.

Strand, Gordon A., to Owens-Illinois, Inc. Jug. 222,606, 11–16–71, Cl. D9—40.

Strand, Gordon A., to Owens-Illinois, Inc. Bottle. 222,611, 11–16–71, Cl. D9—116.

Weckman, Richard L., to Owens-Illinois, Inc. Jug. 222,605, 11–16–71, Cl. D9—40.

Weckman, Richard L., to Owens-Illinois, Inc. Jug. 222,607, 11–16–71, Cl. D9—42.

Whitey Research Tool Co. : *See*—
Callahan, Francis J., Jr., and Matousek. 222,620.

Wilson, Joseph V. : *See*—
Hickmann, Horst R. 222,615.

LIST OF DESIGN PATENTEES

OF

PATENTS WERE ISSUED ON THE 16TH DAY OF NOVEMBER, 1909

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 16, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

2— 3	3,619,813	25— 36	3,619,872	51—117	3,619,952	64— 1	3,620,041	83— 74	3,620,111	99—109	3,620,766
	3,619,814	38	3,619,873	145	3,619,953	3	3,620,042	98	3,620,112	111	3,620,767
12	3,619,815	28— 1.5	3,619,874	170	3,619,949	9	3,620,043		3,620,113	116	3,620,768
49	3,619,816	72	3,619,875		3,619,954	14	3,620,044	107	3,620,114	134	3,620,769
250	3,619,817	29— 25.13:	3,619,876	237	3,619,955	28	3,620,045	226	3,620,115	138	3,620,770
3— 12	3,619,818	.41:	3,619,877	304	3,619,962		3,620,046	84— 1.16:	3,621,105	140	3,620,771
36	3,619,819	78	3,619,878	349	3,619,956	65— 3	3,620,701	.28:	3,621,106		3,620,772
4— 9	3,619,820	91.1	3,619,879	52— 2	3,619,957	18	3,620,702	111	3,620,116	154	3,620,773
41	3,619,821	103	3,619,880	83	3,619,958	42	3,620,703	313	3,620,117	171	3,620,774
142	3,619,822	121	3,619,881	223	3,619,959	86	3,620,704	418	3,620,118	176	3,620,775
148	3,619,823	159.2	3,619,882	241	3,619,960	114	3,620,706	85— 1	3,620,119	199	3,620,776
5— 93	3,619,824	182	3,620,690	302	3,619,961	129	3,620,705	76	3,620,120	235	3,620,154
94	3,619,825	191	3,620,691	309	3,619,964	271	3,620,707	89— 1	3,620,121	295	3,620,155
109	3,619,826	195	3,620,692	483	3,619,963	66— 25	3,620,047	.5	3,620,122	349	3,620,156
113	3,619,827		3,620,693	580	3,619,965	84	3,620,048	.8	3,620,123	100—145	3,620,157
6— 12	3,619,828	200	3,619,883	53— 3	3,619,966	138	3,620,049	13	3,620,124	154	3,620,158
7— 14.1	3,619,829	203	3,619,884	26	3,619,967	68— 8	3,620,051	196	3,620,125	101— 28	3,620,159
8— 14	3,620,662		3,619,885		3,619,968	9	3,620,052	91—280	3,620,126	128.2	3,620,160
21	3,620,663		3,619,886	29	3,619,969	17	3,620,054	412	3,620,127	291	3,620,161
115.6	3,620,665	208	3,619,888	30	3,619,970	23.5	3,620,053	446	3,620,128	102— 65.2	3,620,162
120	3,620,664		3,619,889	37	3,619,971	222	3,620,055	449	3,620,129	70	3,620,165
130.1	3,620,666	229	3,619,890	51	3,619,972	355	3,620,050	506	3,620,130	.2	3,620,166
149.1	3,619,830	267	3,619,887	64	3,619,973	70—362	3,620,056	92— 2	3,620,131	78	3,620,163
	3,619,831	272	3,619,891	79	3,619,974	456	3,620,057		3,620,132		3,620,164
9— 8	3,619,832	401	3,619,892	112	3,619,975	71— 33	3,620,708	33	3,620,133	93	3,620,167
11	3,619,833	402	3,619,893	124	3,619,976	63	3,620,709	79	3,620,134	104—202	3,620,168
10— 2	3,619,834	420.5	3,619,894	160	3,619,978	93	3,620,710	97	3,620,135	105—282	3,620,169
11	3,619,835	432	3,619,895	186	3,619,979	94	3,620,711	151	3,620,136		3,620,170
12—117.2	3,619,836	473.1	3,619,896	190	3,619,981	106	3,620,712	169	3,620,137	369	3,620,171
120.5	3,619,837	475	3,619,897	314	3,619,982	72— 8	3,620,058	93— 36.3	3,620,138	106— 14	3,620,777
135	3,619,838	568	3,619,898	376	3,619,977	60	3,620,059	50	3,620,139	35	3,620,778
13— 2	3,621,102	598	3,619,899	55— 25	3,619,984	112	3,620,060	95— 4.5	3,620,140	47	3,620,779
9	3,621,103	30— 40	3,619,900	84	3,619,980	199	3,620,061		3,620,141	55	3,620,780
	3,621,104	.1	3,619,901	89	3,619,983	248	3,620,062	10	3,620,142	57	3,620,781
20	3,619,839	294	3,619,902		3,619,985	250	3,620,063		3,620,143	59	3,620,782
31	3,619,840	32— 17	3,619,903	158	3,619,986	272	3,620,064	11	3,620,144	69	3,620,783
15—104.06:	3,619,844	26	3,619,904	196	3,619,987	297	3,620,065		3,620,145	84	3,620,784
.93:	3,619,842	33— 72	3,619,905	234	3,619,988	362	3,620,066	15	3,620,146	104	3,620,785
	3,619,843	226	3,619,906	368	3,619,989	407	3,620,067		3,620,147	213	3,620,786
117	3,619,845	34— 44	3,619,907	482	3,619,990	73— 15	3,620,068	42	3,620,148	287	3,620,787
172	3,619,846	56	3,619,908	56— 1	3,619,991	67.2	3,620,069	44	3,620,149		3,620,790
210	3,619,841	164	3,619,909	10.1	3,619,992	.8	3,620,070		3,620,150	288	3,620,788
250.16:	3,619,847	216	3,619,910	12.4	3,619,993	99	3,620,071	64	3,620,151		3,620,789
320	3,619,848	35— 12	3,619,911	13.1	3,619,994	117.4	3,620,072	89	3,620,152		3,620,791
321	3,619,849		3,619,912	.4	3,619,995	133	3,620,073	94.00:	3,620,153	307	3,620,792
323	3,619,850	53	3,619,913	.6	3,619,996	141	3,620,074	96— 1	3,620,721	308	3,620,793
330	3,619,851	36— 2.5	3,619,914	14.6	3,619,997		3,620,075	.2	3,620,722	107— 1	3,620,172
16—114	3,619,852	4.5	3,619,915	249	3,619,998	147	3,620,076	.5	3,620,723	54	3,620,173
164	3,619,853	59	3,619,916	57— 34	3,619,999	151.5	3,620,077	.6	3,620,742	108—151	3,620,174
17— 42	3,619,854	37— 1	3,619,917		3,620,000	170	3,620,078	.8	3,620,729	153	3,620,175
74	3,619,855	12	3,619,918	58.57:	3,620,001	194	3,620,079	3	3,620,724		3,620,176
18— 2	3,619,856	38— 61	3,619,919	.89:	3,620,002	304	3,620,080		3,620,730	110— 8	3,620,177
5	3,619,857	40— 2	3,619,920	140	3,620,003	340	3,620,081		3,620,731	99	3,620,178
	3,619,858	95	3,619,921	58— 23	3,620,004	362	3,620,082		3,620,746	112—168	3,620,179
12	3,619,859	97	3,619,922	28	3,620,005	398	3,620,083	22	3,620,725	407	3,620,180
	3,619,860	118	3,619,923	58	3,620,006		3,620,084	27	3,620,726	114— .5	3,620,181
16	3,619,861	42— 1	3,619,924	80	3,620,007	439	3,620,085		3,620,727	109	3,620,182
19	3,619,862		3,619,927	60— 30	3,620,008	483	3,620,086	29	3,620,728	151	3,620,183
	3,619,863	16	3,619,926	39.16:	3,620,009	521	3,620,087	33	3,620,732	115— 1	3,620,184
	3,619,864	25	3,619,928	.28:	3,620,010	74— 5	3,620,088		3,620,733	116—125	3,620,185
26	3,619,865	50	3,619,929		3,620,011	.6	3,620,089	35.1	3,620,734	117— 5.5	3,620,794
34	3,619,866	69	3,619,930	.36:	3,620,012	31	3,620,090	36	3,620,735		3,620,795
19— 55	3,619,867	901	3,619,925	.72:	3,620,013	34	3,620,091		3,620,736	6	3,620,796
65	3,619,868	43— 15	3,619,931	51	3,620,014	230.23:	3,620,092	.3	3,620,737	7	3,620,797
156.3	3,619,869	43.12:	3,619,932	52	3,620,015	250	3,620,093	48	3,620,738	17.5	3,620,798
282	3,619,870	54.5	3,619,933	54.5	3,620,016	251	3,620,094		3,620,748	22	3,620,799
21— 2.7	3,620,667	131	3,619,934	59	3,620,017	469	3,620,095	49	3,620,739	36.4	3,620,801
23—107	3,620,668	44— 7	3,620,694	202	3,620,018		3,620,096		3,620,740		3,620,802
114	3,620,669		3,620,695	221	3,620,019	473	3,620,097		3,620,741	37	3,620,800
127	3,620,670	62	3,620,696	226	3,620,020	505	3,620,098		3,620,743	44	3,620,803
143	3,620,671	46— 19	3,619,935		3,620,021	524	3,620,099	53	3,620,744	47	3,620,804
165	3,620,672	53	3,619,936		3,620,022	688	3,620,100	68	3,620,745	51	3,620,805
168	3,620,673	76	3,619,937	61— 13	3,620,023	691	3,620,101	74	3,620,747	63	3,620,806
178	3,620,674	94	3,619,938	14	3,620,024	796	3,620,102	94	3,620,749	66	3,620,807
230	3,620,675	201	3,619,939	45	3,620,025	860	3,620,103	108	3,620,750	69	3,620,808
253	3,620,676		3,619,940	46.5	3,620,026	75— .5	3,620,714	114	3,620,751	71	3,620,809
	3,620,677	216	3,619,941	48	3,620,027	.50:	3,620,713	.7	3,620,752	72	3,620,810
	3,620,678	220	3,619,942	72.3	3,620,028	1	3,620,715	99— 2	3,620,753	76	3,620,811
259	3,620,679	221	3,619,943	62— 6	3,620,029	68	3,620,716	3	3,620,754		3,620,812
260	3,620,680	47— 33	3,619,944	11	3,620,030	125	3,620,717	17	3,620,755	94	3,620,813
267	3,620,681	48— 89	3,620,697	17	3,620,031	170	3,620,718	54	3,620,757	106	3,620,814
273	3,620,682	206	3,620,698	28	3,620,032		3,620,719	71	3,620,756		3,620,815
281	3,620,683	212	3,620,699	55	3,620,033	206	3,620,720		3,620,758	114	3,620,816
285	3,620,684	215	3,620,700	58	3,620,034	81— 9.5	3,620,104	78	3,620,759	118	3,620,817
288	3,620,685	49— 30	3,619,945		3,620,035	57.14:	3,620,105	80	3,620,760		3,620,818
295	3,620,686	264	3,619,946	101	3,620,036	121	3,620,106		3,620,761	123	3,620,819
341	3,620,687	425	3,619,947	158	3,620,037	125.1	3,620,107	83	3,620,762	124	3,620,820
356	3,620,688	51— 72	3,619,948	195	3,620,038	341	3,620,108	92	3,620,763	126	3,620,821
367	3,620,689	95	3,619,950	285	3,620,039	82— 2	3,620,109	93	3,620,764	130	3,620,822
24— 68	3,619,871	103	3,619,951	354	3,620,040	83— 66	3,620,110	103	3,620,765	138.8	3,620,823

117–138.8 : 3,620,824
3,620,825
139.5 : 3,620,826
200 : 3,620,827
201 : 3,620,828
3,620,829
3,620,831
204 : 3,620,830
210 : 3,620,832
212 : 3,620,833
213 : 3,620,834
215 : 3,620,835
216 : 3,620,836
217 : 3,620,837
3,620,838
226 : 3,620,839
227 : 3,620,840
237 : 3,620,841
118– 48 : 3,620,186
58 : 3,620,187
323 : 3,620,188
620 : 3,620,189
630 : 3,620,190
637 : 3,620,191
119– 16 : 3,620,192
18 : 3,620,193
98 : 3,620,194
123– 8.13: 3,620,195
32 : 3,620,196
119 : 3,620,197
136 : 3,620,198
140 : 3,620,199
148 : 3,620,200
3,620,201
179 : 3,620,202
182 : 3,620,203
198 : 3,620,204
126–110 : 3,620,205
271 : 3,620,206
127– 32 : 3,620,842
128– 2.05: 3,620,207
.06: 3,620,208
41 : 3,620,209
74 : 3,620,210
89 : 3,620,211
130 : 3,620,212
142 : 3,620,213
146.2 : 3,620,214
213 : 3,620,215
217 : 3,620,216
284 : 3,620,217
334 : 3,620,218
410 : 3,620,219
419 : 3,620,220
422 : 3,620,221
481 : 3,620,222
130– 22 : 3,620,223
27 : 3,620,224
131–235 : 3,620,225
3,620,226
267 : 3,620,227
132–119 : 3,620,229
134– 9 : 3,620,230
15 : 3,620,231
56 : 3,620,232
57 : 3,620,233
86 : 3,620,234
135– 1 : 3,620,235
136– 6 : 3,620,843
86 : 3,620,844
88 : 3,620,845
89 : 3,620,846
3,620,847
138 : 3,620,848
217 : 3,620,849
137– 13 : 3,620,236
67 : 3,620,237
81.5 : 3,620,238
3,620,239
107 : 3,620,228
202 : 3,620,240
216 : 3,620,241
240 : 3,620,242
246.22: 3,620,243
315 : 3,620,244
318 : 3,620,245
357 : 3,620,246
489 : 3,620,247
493 : 3,620,248
503 : 3,620,249
561 : 3,620,250
614.11: 3,620,251
625.11: 3,620,253
.17: 3,620,254
.45: 3,620,255
.48: 3,620,256
.6 : 3,620,252
138– 89 : 3,620,257
178 : 3,620,258
139–187 : 3,620,259
292 : 3,620,260
295 : 3,620,261
307 : 3,620,262
140–123.6 : 3,620,263
141– 1 : 3,620,264
8 : 3,620,265
141– 20 : 3,620,266
364 : 3,620,267
388 : 3,620,268
143– 32 : 3,620,269
47 : 3,620,270
144– 2 : 3,620,271
3 : 3,620,272
3,620,273
146– 52 : 3,620,274
89 : 3,620,275
148– 1.5 : 3,620,850
3,620,851
2 : 3,620,852
13.2 : 3,620,853
32 : 3,620,854
.5 : 3,620,855
121 : 3,620,856
149– 18 : 3,620,857
21 : 3,620,858
150– 52 : 3,620,276
151– 41.76: 3,620,277
152– 9 : 3,620,278
356 : 3,620,279
359 : 3,620,280
156– 20 : 3,620,859
53 : 3,620,861
69 : 3,620,862
79 : 3,620,863
3,620,864
98 : 3,620,865
102 : 3,620,866
117 : 3,620,867
181 : 3,620,868
190 : 3,620,869
197 : 3,620,870
212 : 3,620,871
231 : 3,620,872
247 : 3,620,860
250 : 3,620,873
270 : 3,620,874
272 : 3,620,875
3,620,876
285 : 3,620,877
309 : 3,620,878
345 : 3,620,879
384 : 3,620,880
388 : 3,620,881
461 : 3,620,882
500 : 3,620,883
553 : 3,620,884
563 : 3,620,885
3,620,886
3,620,887
157– 1.55: 3,620,281
159– 13 : 3,620,282
3,620,283
160–331 : 3,620,284
161– 1 : 3,620,888
5 : 3,620,889
6 : 3,620,890
38 : 3,620,891
89 : 3,620,892
109 : 3,620,893
114 : 3,620,894
123 : 3,620,895
3,620,896
154 : 3,620,897
160 : 3,620,898
162 : 3,620,899
3,620,900
3,620,901
165 : 3,620,902
169 : 3,620,903
173 : 3,620,904
190 : 3,620,905
203 : 3,620,906
227 : 3,620,907
248 : 3,620,908
162– 8 : 3,620,909
83 : 3,620,910
90 : 3,620,912
96 : 3,620,911
175 : 3,620,913
198 : 3,620,914
253 : 3,620,915
164– 34 : 3,620,286
52 : 3,620,287
3,620,288
60 : 3,620,289
73 : 3,620,290
108 : 3,620,291
140 : 3,620,292
154 : 3,620,293
155 : 3,620,294
274 : 3,620,285
283 : 3,620,295
308 : 3,620,296
165– 23 : 3,620,297
105 : 3,620,298
166– .5 : 3,620,299
248 : 3,620,300
251 : 3,620,301
258 : 3,620,302
272 : 3,620,303
274 : 3,620,304
282 : 3,620,305
169– 15 : 3,620,306
172– 15 : 3,620,307
248 : 3,620,308
438 : 3,620,309
600 : 3,620,310
173–136 : 3,620,311
138 : 3,620,312
174– 6 : 3,621,107
15 : 3,621,108
16 : 3,621,109
25 : 3,621,110
50.52: 3,621,112
.64: 3,621,111
51 : 3,621,113
52 : 3,621,114
67 : 3,621,115
68.5 : 3,621,116
84 : 3,621,117
115 : 3,621,118
124 : 3,621,119
175– 4.59: 3,620,314
14 : 3,620,313
176– 20 : 3,620,315
32 : 3,620,916
39 : 3,620,917
177– 50 : 3,620,316
54 : 3,620,317
178– 2 : 3,621,120
5.2 : 3,621,121
.4 : 3,621,122
3,621,124
.40: 3,621,123
.8 : 3,621,125
6 : 3,621,126
.5 : 3,621,127
.8 : 3,621,128
3,621,129
3,621,130
3,621,131
7.2 : 3,621,132
.3 : 3,621,133
3,621,134
.6 : 3,621,135
.92: 3,621,136
15 : 3,621,137
3,621,138
69 : 3,621,139
.5 : 3,621,140
88 : 3,621,141
179– 1 : 3,621,142
16 : 3,621,143
18 : 3,621,144
3,621,145
3,621,146
3,621,147
100.2 : 3,621,148
3,621,149
3,621,150
3,621,151
3,621,152
3,621,153
110 : 3,621,154
146 : 3,621,155
150 : 3,621,156
180– 5 : 3,620,318
6.44: 3,620,319
3,620,320
46 : 3,620,321
51 : 3,620,322
65 : 3,620,323
103 : 3,620,324
127 : 3,620,325
181– .5 : 3,620,326
3,620,327
3,620,328
33 : 3,620,329
65 : 3,620,330
182– 36 : 3,620,331
108 : 3,620,332
188– 30 : 3,620,333
251 : 3,620,334
192– 21.5 : 3,620,335
35 : 3,620,336
46 : 3,620,337
53 : 3,620,338
84 : 3,620,339
194– 9 : 3,620,340
10 : 3,620,341
61 : 3,620,342
195– 2 : 3,620,918
7 : 3,620,919
28 : 3,620,920
3,620,921
3,620,922
66 : 3,620,923
3,620,924
3,620,925
3,620,926
82 : 3,620,927
197– 6.7 : 3,620,343
18 : 3,620,344
198– 8 : 3,620,345
16 : 3,620,346
25 : 3,620,347
75 : 3,620,348
78 : 3,620,349
198–102 : 3,620,350
129 : 3,620,351
138 : 3,620,352
160 : 3,620,353
177 : 3,620,354
182 : 3,620,355
193 : 3,620,356
3,620,357
220 : 3,620,358
223 : 3,620,359
199– 50 : 3,620,360
200– 6 : 3,621,157
14 : 3,621,158
42 : 3,621,159
48 : 3,621,160
50 : 3,621,161
61.39: 3,621,162
.45: 3,621,163
.58: 3,621,164
.62: 3,621,165
81.9 : 3,621,166
82 : 3,621,167
84 : 3,621,168
144 : 3,621,169
148 : 3,621,170
3,621,171
153 : 3,621,172
3,621,189
168 : 3,621,173
3,621,174
203– 6 : 3,620,928
38 : 3,620,929
87 : 3,620,930
204– 1 : 3,620,931
15 : 3,620,932
3,620,933
34 : 3,620,934
38 : 3,620,935
41 : 3,620,936
44 : 3,620,937
55 : 3,620,938
56 : 3,620,939
3,620,940
59 : 3,620,941
68 : 3,620,942
148 : 3,620,943
157.1 : 3,620,945
158 : 3,620,944
171 : 3,620,946
180 : 3,620,947
181 : 3,620,948
3,620,949
3,620,950
196 : 3,620,951
198 : 3,620,952
202 : 3,620,953
206 : 3,620,954
283 : 3,620,955
298 : 3,620,956
3,620,957
299 : 3,620,958
302 : 3,620,959
206– 1 : 3,620,361
.7 : 3,620,362
45.15: 3,620,363
46 : 3,620,364
3,620,365
59 : 3,620,366
65 : 3,620,367
208– 60 : 3,620,960
79 : 3,620,961
89 : 3,620,962
111 : 3,620,963
3,620,964
120 : 3,620,965
143 : 3,620,966
179 : 3,620,967
216 : 3,620,968
245 : 3,620,969
209– 2 : 3,620,368
3 : 3,620,369
144 : 3,620,370
210– 23 : 3,620,970
59 : 3,620,971
117 : 3,620,371
169 : 3,620,372
189 : 3,620,373
231 : 3,620,374
484 : 3,620,375
211–123 : 3,620,376
177 : 3,620,377
3,620,378
212– 55 : 3,620,379
214– 1 : 3,620,380
3,620,381
3,620,382
6 : 3,620,383
3,620,384
3,620,385
7 : 3,620,386
8.5 : 3,620,387
10.5 : 3,620,388
15.00: 3,620,427
16.4 : 3,620,389
17 : 3,620,390
38 : 3,620,391
214– 63 : 3,620,392
86 : 3,620,393
147 : 3,620,394
152 : 3,620,395
454 : 3,620,396
506 : 3,620,397
215– 9 : 3,620,398
13 : 3,620,399
44 : 3,620,400
219– 9.5 : 3,621,175
57 : 3,621,176
61 : 3,621,177
107 : 3,621,178
121 : 3,621,179
3,621,180
3,621,181
125 : 3,621,182
3,621,183
127 : 3,621,184
130 : 3,621,185
138 : 3,621,186
145 : 3,621,187
146 : 3,621,188
155 : 3,621,190
211 : 3,621,191
217 : 3,621,192
234 : 3,621,193
3,621,194
243 : 3,621,195
269 : 3,621,196
328 : 3,621,197
349 : 3,621,198
370 : 3,621,199
377 : 3,621,200
388 : 3,621,201
492 : 3,621,202
528 : 3,621,203
553 : 3,621,204
220– 3.6 : 3,620,401
4 : 3,620,402
3,620,403
18 : 3,620,404
40 : 3,620,405
44 : 3,620,406
46 : 3,620,407
60 : 3,620,408
85 : 3,620,409
94 : 3,620,410
315 : 3,620,411
221– 58 : 3,620,412
289 : 3,620,413
222– 5 : 3,620,414
57 : 3,620,415
59 : 3,620,416
136 : 3,620,417
209 : 3,620,418
298 : 3,620,419
386.5 : 3,620,420
402.21: 3,620,421
.22: 3,620,422
414 : 3,620,423
450 : 3,620,424
518 : 3,620,425
224– 5 : 3,620,426
25 : 3,620,428
226– 11 : 3,620,429
97 : 3,620,430
109 : 3,620,431
172 : 3,620,432
227– 10 : 3,620,433
101 : 3,620,434
229– 3.5 : 3,620,435
39 : 3,620,436
43 : 3,620,437
51 : 3,620,438
3,620,439
72 : 3,620,440
85 : 3,620,441
232– 35 : 3,620,443
3,620,444
233– 7 : 3,620,442
235– 60.15: 3,620,446
.2 : 3,620,445
61.11: 3,621,205
3,621,206
92 : 3,621,207
132 : 3,620,447
150 : 3,621,208
3,621,209
3,621,213
.2 : 3,621,210
.27: 3,621,211
3,621,212
151 : 3,621,214
.11: 3,621,216
.12: 3,621,217
.3 : 3,621,215
164 : 3,621,218
170 : 3,621,219
181 : 3,621,220
3,621,221
3,621,222
3,621,223
183 : 3,621,224
193 : 3,621,225
194 : 3,621,226
235–197 : 3,621,227
3,621,228
201 : 3,621,229
236– 46 : 3,620,448
56 : 3,620,449
237– 8 : 3,620,450
238– 10 : 3,620,451
239– 29.5 : 3,620,452
60 : 3,620,453
79 : 3,620,454
132.3 : 3,620,455
533 : 3,620,456
589 : 3,620,457
657 : 3,620,458
670 : 3,620,459
240– 7.1 : 3,621,230
9.5 : 3,621,231
35 : 3,621,232
46.59: 3,621,233
52.4 : 3,621,234
90 : 3,621,235
241– 46.11: 3,620,460
100 : 3,620,461
255 : 3,620,463
294 : 3,620,462
242– 25 : 3,620,482
43 : 3,620,464
55.19: 3,620,467
.2 : 3,620,465
.3 : 3,620,466
68.3 : 3,620,468
74 : 3,620,469
82 : 3,620,470
118.6 : 3,620,471
192 : 3,620,472
3,620,473
195 : 3,620,474
197 : 3,620,475
3,620,476
3,620,477
3,620,478
198 : 3,620,479
199 : 3,620,480
203 : 3,620,481
244– 1 : 3,620,484
29 : 3,620,485
33 : 3,620,486
55 : 3,620,487
77 : 3,620,488
110 : 3,620,489
246–411 : 3,621,237
248– 58 : 3,620,490
106 : 3,620,491
171 : 3,620,496
188 : 3,620,492
278 : 3,620,498
360 : 3,620,493
405 : 3,620,494
430 : 3,620,495
249–127 : 3,620,497
250– 41.9 : 3,621,239
3,621,240
3,621,241
3,621,242
43.5 : 3,621,243
49.5 : 3,621,244
51.5 : 3,621,245
52 : 3,621,246
3,621,247
65 : 3,621,248
71 : 3,621,249
3,621,250
.5 : 3,621,251
3,621,252
3,621,253
83 : 3,621,254
3,621,256
3,621,257
.1 : 3,621,255
.3 : 3,621,258
3,621,259
.6 : 3,621,238
106 : 3,621,260
3,621,261
214 : 3,621,262
218 : 3,621,263
219 : 3,621,264
3,621,265
3,621,266
3,621,267
221 : 3,621,268
227 : 3,621,269
251– 3 : 3,620,499
149.1 : 3,620,500
333 : 3,620,501
355 : 3,620,502
252– 1 : 3,620,972
8.5 : 3,620,973
.55: 3,620,974
21 : 3,620,975
42.1 : 3,620,976
51.5 : 3,620,977
313 : 3,620,978
385 : 3,620,979
404 : 3,620,980
429 : 3,620,981

252–522 : 3,620,982
254– 30 : 3,620,503
188 : 3,620,504
256– 70 : 3,620,505
259– 4 : 3,620,506
25 : 3,620,507
72 : 3,620,508
260– 2 : 3,620,983
.5 : 3,620,985
3,620,986
3,620,987
3,620,990
17.4 : 3,620,988
22 : 3,620,989
25 : 3,620,984
29.6 : 3,620,991
37 : 3,620,992
3,620,993
41 : 3,620,994
45.85: 3,620,995
47 : 3,620,996
50 : 3,620,997
64 : 3,620,998
65 : 3,620,999
77.5 : 3,621,000
78 : 3,621,001
3,621,002
.3 : 3,621,003
80.75: 3,621,004
112 : 3,621,005
145 : 3,621,006
158 : 3,621,007
175 : 3,621,008
207 : 3,621,009
239.1 : 3,621,011
.3 : 3,621,012
.55: 3,621,010
3,621,014
.57: 3,621,015
.6 : 3,621,013
240.1 : 3,621,016
243 : 3,621,017
247.2 : 3,621,018
.7 : 3,621,019
248 : 3,621,020
250 : 3,621,021
251 : 3,621,022
256.4 : 3,621,023
3,621,024
3,621,025
.5 : 3,621,026
293.61: 3,621,027
306.7 : 3,621,028
3,621,029
.8 : 3,621,030
309 : 3,621,031
327 : 3,621,032
332.3 : 3,621,033
340.7 : 3,621,034
343 : 3,621,035
.2 : 3,621,036
.3 : 3,621,037
3,621,038
3,621,039
345.1 : 3,621,040
.2 : 3,621,041
397.7 : 3,621,042
404 : 3,621,043
440 : 3,621,044
448.2 : 3,621,045
.8 : 3,621,046
455 : 3,621,048
465.4 : 3,621,049
466 : 3,621,050
470 : 3,621,051
488.8 : 3,621,047
527 : 3,621,053
533 : 3,621,054
545 : 3,621,055
3,621,056
553 : 3,621,057
561 : 3,621,058
3,621,059
563 : 3,621,060

260–564 : 3,621,061
570.5 : 3,621,052
590 : 3,621,062
594 : 3,621,063
600 : 3,621,064
609 : 3,621,065
611 : 3,621,066
653.5 : 3,621,067
667 : 3,621,068
668 : 3,621,069
675.5 : 3,621,070
678 : 3,621,071
681 : 3,621,072
682 : 3,621,073
835 : 3,621,074
857 : 3,621,075
3,621,076
879 : 3,621,077
884 : 3,621,078
885 : 3,621,079
897 : 3,621,080
924 : 3,621,081
941 : 3,621,082
968 : 3,621,083
976 : 3,621,084
261– 18 : 3,620,509
41 : 3,620,511
79 : 3,620,510
92 : 3,620,512
263– 3 : 3,620,516
4 : 3,620,513
6 : 3,620,517
15 : 3,620,518
28 : 3,620,519
40 : 3,620,514
3,620,515
3,620,520
264– 2 : 3,621,085
71 : 3,621,086
177 : 3,621,087
178 : 3,621,088
211 : 3,621,089
235 : 3,621,090
290 : 3,621,091
322 : 3,621,092
331 : 3,621,093
266– 23 : 3,620,521
43 : 3,620,522
267– 34 : 3,620,523
269– 21 : 3,620,524
270– 61 : 3,620,525
271– 26 : 3,620,526
27 : 3,620,527
51 : 3,620,528
272– 56 : 3,620,529
82 : 3,620,530
89 : 3,620,531
273– 1 : 3,620,532
54 : 3,620,533
101.2 : 3,620,534
150 : 3,620,535
176 : 3,620,536
185 : 3,620,537
274– 1 : 3,620,538
277– 63 : 3,620,539
134 : 3,620,540
237 : 3,620,541
280– 6.1 : 3,620,542
11.13: 3,620,543
.35: 3,620,544
3,620,545
40 : 3,620,546
87.04: 3,620,547
96.2 : 3,620,548
99 : 3,620,549
476 : 3,620,550
479 : 3,620,551
281– 33 : 3,620,552
282– 8 : 3,620,553
285– 18 : 3,620,554
55 : 3,620,555
110 : 3,620,556
228 : 3,620,557

287– 54 : 3,620,558
292– 76 : 3,620,559
201 : 3,620,560
262 : 3,620,483
294– 67 : 3,620,561
82 : 3,620,562
3,620,563
296– 23 : 3,620,564
28 : 3,620,565
35 : 3,621,236
153 : 3,620,566
297–248 : 3,620,567
307 : 3,620,568
388 : 3,620,569
448 : 3,620,570
299– 6 : 3,620,571
8 : 3,620,572
35 : 3,620,573
301– 9 : 3,620,574
302– 53 : 3,620,575
303– 21 : 3,620,576
3,620,577
305– 11 : 3,620,578
307– 24 : 3,621,270
38 : 3,621,271
88 : 3,621,272
.3 : 3,621,273
106 : 3,621,274
137 : 3,621,275
141 : 3,621,276
206 : 3,621,277
216 : 3,621,278
221 : 3,621,279
225 : 3,621,280
228 : 3,621,281
3,621,282
229 : 3,621,283
237 : 3,621,284
3,621,285
238 : 3,621,286
241 : 3,621,287
243 : 3,621,288
247 : 3,621,289
3,621,290
251 : 3,621,291
3,621,292
252 : 3,621,293
3,621,294
3,621,295
3,621,296
265 : 3,621,297
273 : 3,621,298
3,621,299
283 : 3,621,300
290 : 3,621,301
291 : 3,621,302
292 : 3,621,303
293 : 3,621,304
3,621,305
299 : 3,621,306
308 : 3,621,307
318 : 3,621,308
308– 3 : 3,620,579
8.2 : 3,620,580
9 : 3,620,581
160 : 3,620,582
184 : 3,620,583
187.1 : 3,620,584
195 : 3,620,585
207 : 3,620,586
310– 8.7 : 3,621,309
11 : 3,621,310
13 : 3,621,311
49 : 3,621,312
3,621,313
101 : 3,621,314
183 : 3,621,315
312–223 : 3,620,587
323 : 3,620,588
313– 22 : 3,621,316
25 : 3,621,317
64 : 3,621,318
77 : 3,621,319

313–105 : 3,621,320
108 : 3,621,321
3,621,340
184 : 3,621,322
317 : 3,621,323
338 : 3,621,324
315– 25 : 3,621,325
26 : 3,621,326
31 : 3,621,327
55 : 3,621,328
77 : 3,621,329
108 : 3,621,330
207 : 3,621,331
313 : 3,621,332
317– 13 : 3,621,333
16 : 3,621,335
18 : 3,621,334
40 : 3,621,336
100 : 3,621,337
101 : 3,621,338
103 : 3,621,339
157 : 3,621,341
230 : 3,621,342
231 : 3,621,343
234 : 3,621,344
235 : 3,621,345
3,621,346
3,621,347
318– 77 : 3,621,348
135 : 3,621,349
171 : 3,621,350
227 : 3,621,351
3,621,352
314 : 3,621,353
341 : 3,621,354
345 : 3,621,355
480 : 3,621,356
600 : 3,621,357
696 : 3,621,358
320– 43 : 3,621,359
48 : 3,621,360
321– 2 : 3,621,361
3,621,362
3,621,363
11 : 3,621,364
27 : 3,621,365
45 : 3,621,366
69 : 3,621,367
322– 18 : 3,621,368
19 : 3,621,369
23 : 3,621,370
323– 17 : 3,621,371
3,621,372
18 : 3,621,373
43.5 : 3,621,374
3,621,375
50 : 3,621,376
93 : 3,621,377
324– .5 : 3,621,378
3,621,379
1 : 3,621,380
30 : 3,621,381
43 : 3,621,382
51 : 3,621,383
52 : 3,621,384
60 : 3,621,385
64 : 3,621,386
73 : 3,621,387
77 : 3,621,388
3,621,389
96 : 3,621,390
99 : 3,621,391
142 : 3,621,392
150 : 3,621,393
158 : 3,621,394
181 : 3,621,395
325– 38 : 3,621,396
3,621,397
119 : 3,621,398
321 : 3,621,399
404 : 3,620,631
446 : 3,621,400
473 : 3,621,401

328– 37 : 3,621,402
61 : 3,621,403
133 : 3,621,405
155 : 3,621,406
162 : 3,621,404
167 : 3,621,407
329–103 : 3,621,408
110 : 3,621,409
330– 2 : 3,621,410
5 : 3,621,411
107 : 3,621,412
331– 10 : 3,621,450
11 : 3,621,451
25 : 3,621,452
64 : 3,621,453
92 : 3,621,454
94.5 : 3,621,455
3,621,456
3,621,457
3,621,458
3,621,459
3,621,460
3,621,461
96 : 3,621,462
101 : 3,621,463
106 : 3,621,464
107 : 3,621,465
3,621,466
109 : 3,621,467
3,621,468
111 : 3,621,469
332– 14 : 3,621,470
16 : 3,621,471
20 : 3,621,472
23 : 3,621,473
47 : 3,621,474
333– 1 : 3,621,475
.1 : 3,621,476
3,621,477
10 : 3,621,478
22 : 3,621,479
28 : 3,621,480
31 : 3,621,481
72 : 3,621,482
73 : 3,621,483
83 : 3,621,484
95 : 3,621,485
97 : 3,621,486
334– 11 : 3,621,487
335–174 : 3,621,414
205 : 3,621,415
3,621,417
212 : 3,621,416
222 : 3,621,418
230 : 3,621,419
231 : 3,621,420
257 : 3,621,421
264 : 3,621,422
290 : 3,621,423
306 : 3,621,424
336– 58 : 3,621,426
61 : 3,621,425
84 : 3,621,427
146 : 3,621,428
197 : 3,621,429
205 : 3,621,430
337– 5 : 3,621,431
100 : 3,621,432
244 : 3,621,433
348 : 3,621,434
338– 2 : 3,621,435
3 : 3,621,436
5 : 3,621,437
23 : 3,621,446
150 : 3,621,438
180 : 3,621,439
183 : 3,621,440
195 : 3,621,441
309 : 3,621,442
339– 8 : 3,621,443
14 : 3,621,444
17 : 3,621,445
29 : 3,621,447

339– 94 : 3,621,448
99 : 3,621,449
103 : 3,621,413
350– 3.5 : 3,620,589
3,620,590
6 : 3,620,591
9 : 3,620,592
12 : 3,620,593
16 : 3,620,594
86 : 3,620,595
95 : 3,620,596
160 : 3,620,597
162 : 3,620,598
3,620,599
167 : 3,620,600
174 : 3,620,601
184 : 3,620,602
247 : 3,620,603
301 : 3,620,604
305 : 3,620,605
310 : 3,620,606
3,620,607
351–111 : 3,620,608
352– 17 : 3,620,609
172 : 3,620,610
353– 20 : 3,620,611
27 : 3,620,612
101 : 3,620,613
355– 3 : 3,620,614
3,620,615
3,620,616
3,620,617
6 : 3,620,618
8 : 3,620,619
3,620,620
30 : 3,620,621
43 : 3,620,622
53 : 3,620,623
61 : 3,620,624
356– 1 : 3,620,625
4 : 3,620,626
72 : 3,620,627
87 : 3,620,628
160 : 3,620,629
237 : 3,620,630
401– 78 : 3,620,632
147 : 3,620,633
408– 82 : 3,620,634
84 : 3,620,635
141 : 3,620,636
202 : 3,620,637
415–106 : 3,620,638
111 : 3,620,639
126 : 3,620,640
170 : 3,620,641
204 : 3,620,642
416– 90 : 3,620,643
247 : 3,620,644
417– 48 : 3,620,645
79 : 3,620,646
293 : 3,620,647
3,620,648
383 : 3,620,649
417 : 3,620,650
436 : 3,620,651
439 : 3,620,652
568 : 3,620,653
418–129 : 3,620,654
151 : 3,620,655
210 : 3,620,656
424–128 : 3,621,094
232 : 3,621,095
244 : 3,621,096
247 : 3,621,097
258 : 3,621,098
269 : 3,621,099
322 : 3,621,100
330 : 3,621,101
431– 9 : 3,620,657
13 : 3,620,658
66 : 3,620,659
255 : 3,620,660
344 : 3,620,661

CLASSIFICATION OF DESIGNS

D 8– 52 : 222,603
154 : 222,604
D 9– 40 : 222,605
222,606
42 : 222,607

D 9– 42 : 222,608
70 : 222,609
116 : 222,611
137 : 222,610
290 : 222,612

D 9–290 : 222,613
D14– 3 : 222,614
222,615
6 : 222,616
27 : 222,617

D14– 30 : 222,618
D23– 4 : 222,619
29 : 222,620
D26– 5 : 222,621
14 : 222,622

D30– 14 : 222,623
D33– 14 : 222,624
D34– 11 : 222,625
222,626
222,627

D44– 9 : 222,628
D48– 16 : 222,629
32 : 222,630
D49– 19 : 222,631
D83– 1 : 222,632

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,619,906	6 : 3,620,171	6 : 3,620,558	6 : 3,621,259	9 : 3,620,081	10 : 3,620,978
3,620,089	3,620,175	3,620,559	3,621,273	3,620,148	3,621,008
3,620,095	3,620,181	3,620,572	3,621,280	3,620,161	3,621,010
3,620,529	3,620,182	3,620,583	3,621,285	3,620,166	3,621,020
3,620,539	3,620,184	3,620,587	3,621,288	3,620,218	3,621,059
3,620,612	3,620,185	3,620,594	3,621,290	3,620,239	11 : 3,619,896
3,620,765	3,620,208	3,620,596	3,621,291	3,620,288	3,619,924
3,620,791	3,620,210	3,620,605	3,621,326	3,620,289	3,620,846
3,620,939	3,620,219	3,620,607	3,621,330	3,620,332	3,621,130
3,620,998	3,620,221	3,620,608	3,621,338	3,620,403	3,621,193
3,621,258	3,620,222	3,620,635	3,621,345	3,620,411	3,621,228
3,621,461	3,620,225	3,620,650	3,621,353	3,620,412	3,621,406
4 : 3,619,827	3,620,241	3,620,658	3,621,365	3,620,447	3,621,407
3,620,086	3,620,255	3,620,673	3,621,371	3,620,470	3,621,460
3,620,155	3,620,267	3,620,676	3,621,372	3,620,473	12 : 3,620,049
3,620,997	3,620,274	3,620,679	3,621,377	3,620,531	3,620,138
3,620,999	3,620,294	3,620,681	3,621,388	3,620,553	3,620,220
3,621,296	3,620,313	3,620,688	3,621,392	3,620,689	3,620,246
3,621,300	3,620,329	3,620,698	3,621,394	3,620,699	3,620,270
3,621,450	3,620,342	3,620,700	3,621,405	3,620,815	3,620,321
6 : 3,619,815	3,620,347	3,620,743	3,621,419	3,620,855	3,620,326
3,619,817	3,620,353	3,620,766	3,621,432	3,620,861	3,620,371
3,619,820	3,620,365	3,620,771	3,621,438	3,620,929	3,620,568
3,619,826	3,620,370	3,620,795	3,621,447	3,620,933	3,620,634
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3,619,840	3,620,384	3,620,820	3,621,452	3,620,991	3,620,818
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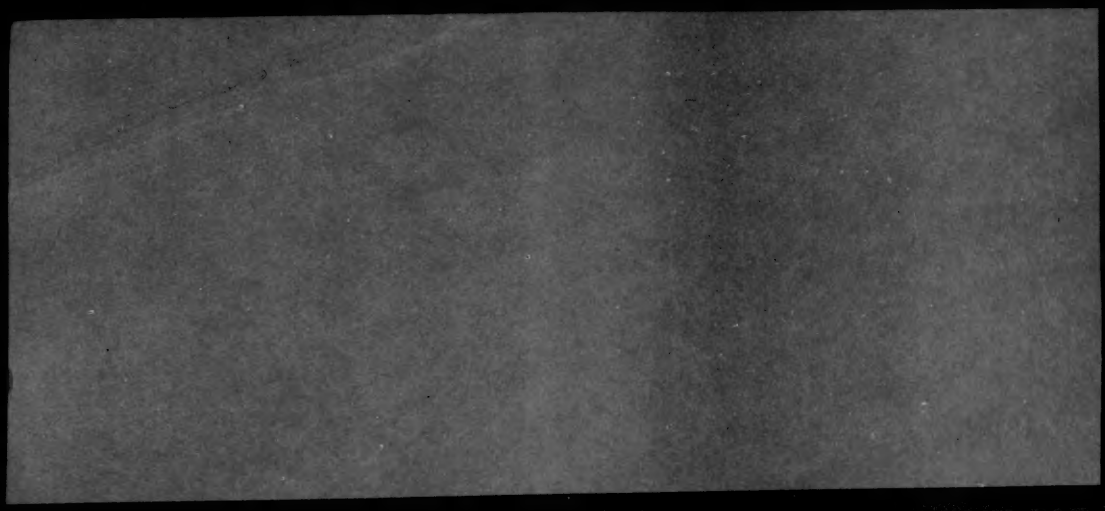

U.S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

ENVIRONMENTAL SCIENCE SERVICE ADMINISTRATION
Robert M. White, *Administrator*

COAST AND GEODETIC SURVEY
Lt. Gen. Edward J. Rollwagen, *Acting Commissioner*